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An Address
ON
SOME PROBLEMS IN THE TREATMENT OF NEUROSYPHILIS.

Delivered before the West Kent Medico-Chirurgical Society on March 11th, 1927,

BY J. L. BIRLEY, M.D. OXF., F.R.C.P. LOND.,
PHYSICIAN TO OUT-PATIENTS, ST. THOMAS'S HOSPITAL; CONSULTANT PHYSICIAN TO THE ROYAL AIR FORCE.

THE feelings of anyone who to-day ventures to express an opinion on this subject must be very different from those which would have been experienced a generation ago. At that time it was generally agreed that mercury and the iodides were indicated in all forms of neurosyphilis with the exception of tabes and general paresis, and that the latter conditions, even supposing that they were syphilitic in origin, were not amenable to any therapy, specific or otherwise. To-day, on the other hand, these comfortable beliefs have been rudely shaken by a body of knowledge which has been accumulated so rapidly that our powers of assimilation have been seriously strained and our equilibrium disturbed. Conflict and controversy, however, are the handmaidens of progress, for although they are apt to engender extreme views at the outset, these in turn are prone to beget more moderate and stable opinions. This paper can make no claim to solve the riddles of neurosyphilis; it represents merely an attempt to sift the known from the unknown, on the principle that the sense of one's ignorance is a much more useful thing than the sense of one's knowledge. So little knowledge is absolute, and so great is the desire of the human mind to believe that it is.

In the present century we can identify three important landmarks in the history of syphilis. First, the discovery in syphilitic lesions of the *Spirochæta pallida* by the zoologist, Schaudinn, in 1905, and the subsequent finding of the parasite in the nervous tissues of paralytics and tabetics by Noguchi; secondly, the complement-fixation test published by Wassermann in 1908; and thirdly, the introduction in 1909 by Ehrlich of the spirochæticide salvarsan and of the allied compounds which have since replaced it. Of the first of these discoveries it may be said that it has shed light on what was previously dark; of the second and third, that they have opened a door by which those who will may enter and explore the hidden mysteries of syphilitic disease.

Two guiding principles must govern any discussion of the treatment of neurosyphilis. The first is one of general application—viz., that all rational therapy must be based on an adequate comprehension of the nature of the lesions to be treated. The second is more particular, and lies in the recognition which is becoming increasingly evident that the nervous system is, or may be, affected with greater frequency and at a much earlier stage of the proceedings than was hitherto supposed. These two factors together indicate that our conceptions of neurosyphilis will be incomplete unless we have a clear idea of the changes induced in the organism from the time of infection until either the disease is eradicated or the patient dies. The problems underlying neurosyphilis have become more and more identified with the broader problems of syphilitic infection in general, subject only to those peculiarities of structure and function which distinguish nervous from other tissues. One practical result which has emerged from the recognition of this early involvement of the nervous system is that the observation and treatment of these early phenomena, many of them unaccompanied by subjective or objective evidence of nervous disease, are carried out by the syphilologist to the exclusion of the neurologist. To raise any fundamental objection to this procedure would savour of pedantry, for at this early stage the object of treatment—namely, the destruction of the spirochæte—can be achieved in a very large majority of cases, and the choice of drugs and dosage can confidently be left to the unfettered discretion of the syphilologist. But the fact that these early stages of neurosyphilis have now come within the orbit of venereal departments has so stimulated their appetites that there is now a further tendency for neurosyphilis, and, in fact, for syphilis generally, in all its stages to become isolated from neurology and general medicine respectively. This development I regard as in some respects unfortunate, since the problems underlying neurosyphilis are so diffuse that they merit the combined attention of workers in many fields and from varying angles.

EARLY MENINGEAL REACTION.

In the primary stage of syphilis, even before the Wassermann reaction in the blood has become positive, a lymphocytosis may be observed in the cerebro-spinal fluid in a small percentage of cases. The frequency of pathological changes in the fluid increases through the late primary stage (Wassermann reaction in blood positive) up to the so-called secondary stage (acute syphilis), until it reaches, in the absence of treatment, something like 50 per cent. in the second and third half years from the time of infection. Speaking generally, it may be said that during the whole period of the first 18 months the essential change in the fluid is an excess of cells, and that a positive Wassermann reaction increases pari passu with the length of time which has elapsed since the primary infection. As compared with the pleocytosis, however, a positive Wassermann reaction in the fluid is relatively rare during the first 18 months. For example, in 1314 cases of syphilis examined by Fildes, Maitland, and Parnell a pleocytosis of five cells or more per cubic millimetre were found in the cerebro-spinal fluid as follows:—

Type of case.	No. of cases.	Pleocytosis.	Fluid W.R. +
Primary (blood W.R. negative) ..	144	21 (14%)	0
Late primary (W.R. +); no rash; up to 18/12 from infection ..	371	80 (21%)	12 (3%)
Secondaries present or history of; (W.R. +) up to 18/12 from infection	512	160 (30%)	35 (6%)

The great majority of these cases had had no treatment or very inadequate treatment, and presented no clinical evidence of nervous disease. The changes in the cerebro-spinal fluid are due to a meningeal inflammation, and indicate that the meninges are reacting in a diffuse sort of manner to the presence of the spirochæte, much in the same way as the skin is reacting. The condition, in fact, is in the nature of a meningeal rash, and like the cutaneous eruption, shows a tendency to spontaneous resolution and repair. But acute syphilis is not a disease of the covering or supporting tissues only, since at an early stage the virus has become generalised by the blood stream and the parasites may penetrate into all the body tissues, including the parenchymatous, more specialised, tissues of various organs, such as the liver, testis, and central nervous system. And just as a degeneration of the essential hepatic cells, recognised as an acute yellow atrophy, may be observed in the acute stages, so also, if rarely, a parenchymatous degeneration of nerve-cells and neuroglia may occur within a few months of infection (acute encephalitis). The question, therefore, arises, What is the significance of the early meningeal reaction in relation to late parenchymatous syphilis?

Significance of the Reaction.

That the meningeal reaction is a reaction to parasites within the meninges, and not a reaction à distance can hardly be disputed. Do the parasites

always gain entrance to the essential nervous elements by traversing the meninges, and do they do so at this early stage? The answer is probably Yes in both cases. The French school have especially insisted on the fact that a meningitis, as evidenced by an increase of cells and of globulin, always precedes involvement of the nervous parenchyma, and evidence is accumulating that in late neurosyphilitic conditions, such as tabes, the fluid, though not infrequently normal when the patient comes under observation, has at some previous time shown pathological changes. Further, unless the spirochæte gains admittance to the nervous tissue proper during the acute stage, it has to be assumed that in latent syphilis the parasite wanders from some distant focus until it comes to rest in the brain or cord. There is no evidence of such migration; in fact, it would seem that such nests of spirochætes as are not destroyed in the acute stage settle down into some intimate relation with the tissues, by virtue of which they become fixed and the condition remains "latent" over long periods.

If this reasoning is correct, we are forced to the following conclusions: (*a*) that the meningeal reaction is in itself not direct evidence of the penetration of the parasite into the essential parenchyma; (*b*) that where such penetration occurs it is probably associated with a transient meningitis; and (*c*) that access to the nervous elements occurs in the acute stage, although clinical evidence thereof may be deferred for many years. What we require and do not possess is some means of determining in any given case the lodgment of the parasite in the nervous parenchyma apart from its coverings and blood-vessels. If, on the other hand, pathological changes in the fluid are not a sine quâ non for deeper penetration of the parasite, we should have to admit that a persistently normal fluid during the first two years was no security against the subsequent development of general paralysis of the insane or tabes.

THE COURSE AND SIGNIFICANCE OF CHANGES IN CEREBRO-SPINAL FLUID.

Having noted the existence of these early meningeal phenomena, we now have to consider the changes which they undergo and the significance of those changes. Here we are on much more difficult ground. First it must be recalled that the meningeal reaction is part of the acute stage of syphilis, the period, that is to say, at which the organism is rapidly mobilising all its mechanisms of defence until a climax is finally reached, culminating in a vigorous humoral and cellular reaction characterised by the rapid production of antibodies and the destruction, partial or complete, of the invading parasites. This stage would seem to be followed by a period of relative exhaustion, during which the sensitiveness of the tissues undergoes a rapid diminution and any spirochætes which have escaped destruction relapse into a state of tranquillity as judged by clinical standards. In view of the natural resistance of the tissues it is easy to understand that an abnormal fluid in the acute stage may spontaneously revert to normality or can be brought to normality by treatment; in fact, this appears to happen in something like 85 per cent. of the cases, and in a large proportion of such cases the fluid remains normal permanently. It is the refractory minority which provides us with our difficulties, for we have no means of knowing what individuals will recover spontaneously or under treatment without observation and trial. If it were possible to measure individual immunity, to anticipate the extent of individual capacity to react, we could separate at the outset the refractory minority from the tractable majority.

In this connexion some observations on the treatment of acute syphilis en masse suggest themselves. We can omit from consideration cases in the primary stage before the Wassermann reaction has become positive in the blood, since in such cases a permanent cure can be effected by the use of arsenic combined with mercury or bismuth in approximately 100 per cent. Let us suppose, therefore, that 100 cases present themselves for treatment within six months of infection all with positive blood Wassermanns, and that after a course of treatment, represented by X, we obtain 85 cures, and that by considerably increasing the dosage by an amount represented by Y we cure the remaining 15. When the next batch of 100 similar cases present themselves for treatment, it would be clearly inadmissible to prescribe an X+Y course of treatment with a view to obtaining 100 per cent. of cures, since by doing so we should run the risk of overtreating 85 per cent. The dosage of arsenical preparations usually considered adequate has shown a tendency to increase very materially during the past decade, and although much of the increase is *undoubtedly* justifiable and productive of good results, there seems to be a danger of its passing beyond the bounds of judicious therapy, and that this excess of zeal is based to some extent on a misinterpretation of the value of statistical data.

To return to the changes in the cerebro-spinal fluid, various possibilities are open to consideration. (1) The fluid remains normal throughout; here we can confidently exclude any risk of neurosyphilis, early or late. (2) There is a pleocytosis which disappears spontaneously or under treatment within six months. Most of such fluids remain normal permanently, and according to Dreyfus, if they are still normal one year after treatment has ceased, neurosyphilis is improbable. (3) The fluid after becoming normal reverts to "positive" again within a few months. Such fluids can with difficulty be brought back to normal again by intensive treatment, but they show a tendency to relapse. (4) There is a feeble meningeal reaction or possibly none at all; the parasite, however, gradually acquires better conditions of growth and after a lapse of many years, pathological changes appear in the fluid which may be permanent. What is the proportion of those in the last three groups who develop neurosyphilis is unknown, nor do we know with any completeness the changes which the fluid undergoes in the years preceding the advent of such conditions as tabes or general paralysis of the insane. All that seems reasonably certain is the fact that fluids which have reverted from "negative" to "positive," as well as those which become positive many years after infection, are altered by treatment with the greatest difficulty or not at all. We may regard these differences of behaviour in the cerebro-spinal fluid as an expression of different degrees of individual reaction to the spirochæte.

TREATMENT OF MENINGO-VASCULAR SYPHILIS.

Before passing on to the consideration of chronic syphilis, mention should be made of the fact that the nervous system may suffer severe damage in the acute stage as a result of pathological changes involving primarily the meninges and blood-vessels. At this stage, however, by energetic treatment the virus can be destroyed, the cerebro-spinal fluid brought back to normal, and the patient restored to health apart from such residual palsies as may have been determined by the destructive character of the initial lesions. As a general rule, it may be stated that the shorter the interval which has elapsed from the primary infection, the better the prognosis, and that early meningo-vascular syphilis is rarely followed in later years by tabes and even more rarely by general paralysis.

To discuss the details of treatment of acute neurosyphilis would be out of place, but a few broad principles may be mentioned. Our object at this stage is to sterilise the meninges as rapidly as possible, and for this purpose stabilarsan or neosalvarsan are essential. I am, however, convinced that mercury properly used, as, for example, by inunction, is still an indispensable adjunct, and is slightly preferable to bismuth, although I must confess to have had insufficient experience of the more recent bismuth preparations such as bismoxyl, which are free from the objections which attached to some of the earlier ones. Lastly, the iodides in large doses up to gr. 60 a day or even more may sometimes effect a miracle

when arsenic and mercury have failed, and they should form part of the treatment in the intervals of arsenical administration.

ALLERGY AND CHRONIC SYPHILIS.

It is well known that the lesions of late (chronic) syphilis present certain clinical features which differentiate them from the lesions of the acute stage. A consideration of these peculiarities reveals the fact that the differences are of degree rather than of kind, and depend on an alteration in the reactive condition of the tissues concerned. This alteration is in the nature of a greatly increased sensitiveness to those spirochætes which have escaped destruction in the acute stage. The phenomenon is called allergy. In this hyperallergic condition the tissues react excessively to a small number of spirochætes, and the reaction is characterised by a great tendency to proliferation and degeneration. Where the mesoblastic, supporting, bactericidal tissues are chiefly involved, the result is excessive fibrosis, strangulation of blood-supply, and gummatous necrosis. Where, on the other hand, the more specialised, highly differentiated, and consequently less resistant cells, whether visceral or nervous, are concerned, the result will be degeneration. This increased susceptibility of the tissues is developed after the subsidence of the acute stage, and would appear to be dependent on the intoxication of the tissues which is necessarily associated with destruction of spirochætes in large numbers, and the consequent liberation of toxin and its fixation by the tissues. It must, however, be remembered that if late parenchymatous neurosyphilis is to be interpreted in terms of allergy, it has to be admitted that this increased susceptibility of the tissues can develop in the absence of any clinical signs of acute syphilis; for in tabes and general paralysis of the insane a history of secondaries is the exception and not the rule.

LATE PARENCHYMATOUS NEUROSYPHILIS.

At the International Congress of Medicine held in London in 1913, a discussion took place on the Nature of the Condition termed Parasyphilis. A few months prior to the meeting Noguchi had succeeded in demonstrating the spirochæte in the brains of paralytics, and the older theories were beginning to wobble. The toxic-degenerative theory of parasyphilis, introduced by Fournier in 1894, assumed that tissues long exposed to the toxins of syphilis finally give way under the strain and undergo a rapidly progressive decay, and that in general paralysis the degenerative products exert an irritant effect on the supporting tissues of the brain with consequent changes in these structures. This view seemed to be warranted by: (*a*) the resistance of parasyphilitic conditions to antisyphilitic remedies; (*b*) the absence of the spirochæte from the lesions; (*c*) the long interval between infection and the onset of parasyphilis; and (*d*) the apparent "systemic" nature of the pathological changes. Those who are opposed to the conception of "parasyphilis" and insist on the fundamental pathological unity of all syphilitic processes, point out that: (*a*) the resistance to treatment is due to a failure on the part of arsenical preparations to penetrate to the deeper tissues which harbour the spirochæte; that (*b*) the spirochæte has been demonstrated in the brains and cords of paralytics and tabetics; that (*c*) the long interval is due to the slow development of increased tissue susceptibility; and that (*d*) the changes are not strictly "systemic" at all, and their peculiar distribution can be explained by increased opportunities for spirochætal invasion enjoyed by certain territories of the nervous system as opposed to others.

Before considering these points a little more fully, one further objection which is frequently advanced against the toxic theory may be noted—viz., that the toxin is "hypothetical." The question arises, What is meant by the term "hypothetical toxin"? I am not aware, for example, that the toxin of pneumococcal infections has yet been proved to have any phenomenal reality, but even supposing that this unawareness is due to ignorance on my part, I should still feel justified in believing in its existence, for on no other hypothesis can I explain the phenomena of pneumonia or of pneumococcal peritonitis. But as regards parasyphilis, the toxin theory does not seem to explain the observed facts, for it is difficult to conceive, inter alia, of a toxin operating over a long period on such vulnerable structures as the essential elements of the nervous system without producing any symptoms until the final collapse. On these grounds—viz., incompatibility with the observed facts and readier explanation by a quite different hypothesis—the theory may be inadmissible, but it must be pointed out that its repudiation does not necessarily entail the view that spirochætes never produce toxins.

With respect to the other objections to Fournier's conception of parasyphilis, there can be no dispute as to the presence of the spirochæte in the brains of paralytics, but there is some difference of opinion as to their distribution. At first they were found only in the substance of the brain and in intimate relation to the ganglion cells, whereas more recently they have also been observed in the perivascular tissues, and even within the lumen of the vessels. They can only rarely be discovered in the meninges or the meningeal vessels. In tabes their demonstration is more difficult, but Richter has recently described them in the posterior roots. These points are of importance in connexion with treatment.

ARE THE LESIONS "SYSTEMIC"?

Tabes, general paralysis, and "tabetic" optic atrophy have long been regarded as systemic diseases, but the more we know of their morbid anatomy the less systemic do they become. The changes in general paralysis of the insane are not limited to a selective degeneration of the cells of the frontal lobes; on the contrary, pathological alterations in the mesoblastic elements are frequently present, alterations which are indistinguishable from those met with in much earlier manifestations and are gummatous in character. Both sets of changes are referable to the heightened susceptibility of the tissues, both parenchymatous and mesoblastic, by virtue of which they react excessively to the presence of a relatively small number of spirochætes.

The condition of affairs in tabes is complicated by the fact that there seems to be no unanimity as to the essential lesion responsible. It is generally agreed that the exogenous fibres of the posterior root system are affected and not the endogenous, but the localisation and nature of the lesion are still matters of controversy. According to Richter, the essential lesion is a chronic granuloma of the extramedullary portion of the posterior roots, between the cord and the posterior root ganglion, affecting first the nerve-sheaths and later the nerve-fibres, which slowly degenerate. The short and medium fibres degenerate before the long fibres, and the degeneration never extends beyond the primary neuron—i.e., as far as the arborisations round the cells at the base of the posterior horns in the case of the shorter fibres, and the cells of the medullary nuclei in the case of the long fibres. This secondary degeneration leads to (or is associated with) proliferation of the supporting neuroglia which results in a degeneration of the endogenous fibres of the posterior columns, so that finally we have the text-book picture of the disease—viz., almost total degeneration of the posterior columns. But the picture is apt to be misleading unless it is realised that the posterior column degeneration is secondary to events taking place in the posterior roots, and that even the latter are very unequally affected. For example, the trigeminal, upper thoracic, lower lumbar, and upper sacral roots are far more frequently and earlier involved than the intervening roots. It has been suggested that this curious distribution is due to the passage of the spirochæte or its toxin along the perineural lymphatics drained by those peripheral areas in which "secondary" lesions are most common—e.g., face,

chest, and perineum. For this migration, which presumably takes place in the acute stage without, however, necessarily producing root symptoms, no very satisfactory evidence is forthcoming, and the infrequency of any clinical manifestations of acute syphilis in those who later become tabetic is not in its favour. The explanation of this selective root involvement is, I think, still to seek, as in fact are the selective characteristics of most diseases. Another example of selective action in tabes is the well-established tendency for the fibres subserving pain to degenerate earlier than other afferent fibres, with the result that areas of analgesia are often the only sensory disturbances which can be demonstrated. Why this should be so it is impossible to say, unless it is in some unexplained manner concerned with the limited insulation of the peripheral nerve-endings of the fibres subserving pain as compared with the high degree of insulation enjoyed by the nervous system as a whole. The lightning pains of tabes are undoubtedly due to the implication of the pain fibres in the posterior roots, and pains indistinguishable from tabetic pains may occur as a consequence of the involvement of the posterior roots in a subacute meningitis. But although a meningitis may complicate tabes, it does not, according to most authorities, form an essential part of its pathology.

Primary or tabetic optic atrophy can no longer be regarded as a systemic degeneration; the changes in the optic nerves involve the interstitial tissues primarily and the nerve-fibres secondarily. Moreover, as Léri and others have pointed out, the retinal cells, the axons of which are represented by the optic nerve-fibres, remain intact, and contrary to what is often stated, the condition does not always go on to complete blindness.

LATENCY.

The latency of "parasyphilitic" affections is not confined to the nervous system, since many other syphilitic lesions, such as those involving the bones, are similarly delayed. Nevertheless, the latency of the nervous lesions is perhaps more consistent and pronounced than those of any other system. In general paralysis of the insane the average in 400 cases was 17 years from the date of infection; in tabes it is probably about the same or even longer. It is possible that the latency is in some way related to a phenomenon which has long been recognised—viz., the absence, or, at any rate, the insignificance, of "secondary" manifestations, as well as the relative rarity of gummatous lesions in tabetics and paralytics. Some curious views have emerged from a recognition of this singular coincidence. For example, general paralysis of the insane is about five times commoner in men than in women, and so uncertain was the diagnosis of chancre in the female sex before the discovery of the spirochæte and the Wassermann reaction, that our forefathers were in the habit of withholding treatment until the appearance, or otherwise, of a rash settled the matter. It has been suggested that the rarity of general paralysis of the insane in women is due to the fact that they were rarely treated in the primary stage. A precisely similar line of argument is responsible for the view that artificial—i.e., therapeutic—"suppression" of acute syphilis, particularly by the use of arsenical preparations, predisposes to tabes and general paralysis of the insane, or to put it more bluntly, "if you have syphilis at all, have it badly." But it must not be forgotten that in an enormous majority of cases of tabes and general paralysis of the insane the absence of secondaries is not due to treatment, since no treatment, or only very inadequate treatment, has been received. It is, therefore, not the suppression of the rash, but rather its failure to appear which is significant. Its non-appearance must be ascribed to some individual peculiarity, either of the virus or of the patient. Now, unless we accept the conception of a neurotropic virus, which on many other grounds appears inadmissible, there is little or no evidence of variations in virulence of different strains of spirochæte, and we have to conclude that the problem concerns the soil rather than the seed. It is permissible, therefore, to regard the presence of acute secondary manifestations in the absence of treatment as a token of the production of antibodies of sufficient quality and quantity to afford a considerable measure of protection to the essential nervous elements against subsequent degeneration. Such a view in no way justifies the withholding of treatment in expectation of a rash, although it is admittedly difficult to adduce satisfactory evidence that early treatment with arsenic, mercury, or both, influences the incidence or latency of late neurosyphilis in any particular direction.

The latency of parenchymatous neurosyphilis seems to me difficult to account for on any hypothesis, but it is not peculiar to syphilis, for a somewhat similar state of affairs prevails in disseminated sclerosis and encephalitis lethargica. The opponents of the toxic theory invoke two factors to explain the phenomenon: (*a*) an increased susceptibility of the tissues concerned, which renders them unduly vulnerable to (*b*) an exacerbation of spirochætes. How and why this exacerbation occurs is obscure. As regards (*a*) it is recognised that the reaction of the organism to microbic invasion is of two kinds, cellular and humoral, and it is not unlikely that these two modes of reaction are not necessarily proportional to one another in time or degree. On this hypothesis, for example, it may be supposed that in the tabetic, who has never had any manifestations of acute syphilis and only a very insignificant chancre, the cellular reaction is subnormal, whereas the humoral reaction (antibody production) is considerable, with the result that large numbers of parasites are fixed and rendered innocuous in the secondary stage, although a few escape and remain locked up in the nervous parenchyma. In such an individual it is further natural to suppose that owing to the relative meagreness of the cellular reaction hyperallergie takes an abnormally long time to develop; accordingly, many years elapse before his nervous system is capable of reacting forcibly to any exacerbation of its imprisoned spirochætes. These considerations are supported by the fact that in "mild" syphilis gummata are later in appearing than in "bad" syphilis. In the latter the cellular reaction is proportionately more pronounced than the humoral; hyperallergie develops quickly and gummatous syphilides follow close on the secondary stage. A serious inadequacy of both types of reaction is represented by cases of acute cachectic syphilis, where the patient dies, so to speak, without a struggle. This last mode of response is particularly found in unsyphilised communities, but is rare among the races of Western Europe. There can, I think, be very little doubt that the Western European is becoming more and more resistant to syphilis, and that this increasing immunity lies behind many of the problems of syphilis. It is possible that the preponderance of the humoral reaction over the cellular is an expression of this immunity, and if this be true, we should expect to find a greater incidence of parenchymatous neurosyphilis in those communities longest exposed to syphilitic infection. Whether this is so or not, I do not know; the statistical evidence is very conflicting.

THE WASSERMANN REACTION AND RESISTANCE TO TREATMENT.

The treatment of syphilis is nowadays so intimately bound up with variations in the Wassermann reaction, that it is impossible to discuss one without the other. As is well known, the test is based on the fact that an antigen in the presence of its own specific immune body reacts or combines with the latter in such a way that the combination so formed has the power of "fixing" any complement that may be present. If now to such a system a hæmolytic serum (immune body) and its specific antigen (sensitised red cells) be added, no hæmolysis occurs, since the complement necessary to "complete" the hæmolysis is not available, being fixed. If,

however, the antigen and immune body are not strictly homologous, the complement will remain free to combine with the hæmolytic amboceptor-antigen complex, and complete hæmolysis will result. It is further well known that in Wassermann's original technique the antigen employed was specific—i.e., an extract of syphilitic liver—but it was soon found that non-specific—i.e., non-syphilitic—antigens served the purpose equally well, and the antigen most commonly used in this country and America at the present time is an alcoholic extract of non-syphilitic heart muscle with the addition of cholesterin. In other words, the antigen now employed is a solution of lipoids and not necessarily, at any rate, an antigen at all. Clearly, then, the reaction is not biologically specific in the sense that the agglutination of typhoid bacilli by typhoid serum is specific, and we accordingly are not justified in regarding the Wassermann reaction, or the simpler precipitin tests of Sachs-Georgi and others, as true immunity reactions. But in view of the great delicacy of the test as an indication, at least in non-tropical countries, of past or present syphilitic infection, it is evident that we are dealing with some substance which is almost invariably present in the blood as a consequence of such infection. The question arises, What is the nature of the reacting substance (reagin) and where does it arise? Until these questions can be answered the significance of a positive Wassermann reaction, apart from diagnosis, must remain to some extent conjectural, and so far as I am able to form a judgment they still await an answer. It is thought that this reagin may be a lipoid-protein compound produced by the tissue cells in contact with the parasite, and that this antibody-like substance, linked with serum protein, possesses a greater aptitude for flocculating organic lipoids in suspension than is possessed by the serum proteins of a healthy individual. According to this view, reagin cannot be regarded as a true antibody in the sense that it is inimical to the spirochæte. It might be interesting to compare the non-specific Wassermann reaction in all stages of syphilis with a reaction carried out with a specific antigen—e.g., a culture of dead spirochætes.

As to the diagnostic value of the reaction there can surely be only one opinion—namely, that in the hands of a competent serologist it constitutes one of the most delicate tests of its kind in the whole range of medicine. As regards its significance in other directions, however, opinions vary. Does, for example, a positive reaction indicate that the tissues *are reacting* to living spirochætes, or merely that they *have so reacted* in the past? Is, in other words, a positive reaction tantamount to a persistence of activity of the infective agent? So long as the reaction remains biologically unspecific it is difficult to see how these vital questions can be answered with any finality, and accordingly we shall continue to be witnesses of courses of treatment being meted out to positive Wassermann reactions, irrespective of any other evidence of the existence of syphilitic lesions. In unwise hands the impetus given by the researches of Ehrlich and Wassermann is in danger, as Nonne has said, of degenerating into a frenzy, while its tendency to promote syphilophobia, a condition more intractable than syphilis itself, constitutes a real and increasing menace; a passion to treat syphilis does not always preclude neglect of the syphilitic. But it is as well to remember that anyone who takes up the attitude that he intends to regard a positive reaction as evidence of spirochætal activity until it is proved to be otherwise, and, therefore, is bound to treat it, is perfectly justified in doing so, provided that he does not lose sight of the fact that the mental reaction of his patient is at least as important as that of his serum.

VIEWS CONCERNING TREATMENT.

Success in the treatment of such conditions as tabes and general paralysis of the insane is obviously limited in scope; we cannot expect to do more than check or at the most arrest the course of the disease. There is no question of restoring the function of nerve-fibres or cells which have already undergone degeneration. But even within these limits late parenchymatous neurosyphilis is resistant to treatment, as also are the associated changes in the cerebro-spinal fluid. Seeing that our ideas as to treatment must conform with our ideas of the nature of the condition to be treated, it is not surprising to find two extreme views in opposition. The one, maintaining that these conditions represent a premature decay of nervous elements as a result of prolonged intoxication by the syphilitic virus, declaims on the utter futility of any treatment at all. This view, now almost defunct, provides a sharp contrast with the other, which, insisting on the fundamental pathological unity of all syphilitic processes, advises with logical consistency antisyphilitic treatment for the rest of the patient's life. When one inquires why the results of life-long treatment are not more encouraging, one is offered the choice of two explanations. The first is that the essential nervous elements, whether frontal lobes or posterior roots, owing to certain anatomical arrangements or physiological peculiarities, cannot be reached by the remedies employed, and that treatment can only effect improvement to the extent that the lesions are mesoblastic and not parenchymatous. The same line of argument maintains that positive Wassermann reactions which persist in spite of treatment are due to spirochætes locked away in inaccessible non-vascular fastnesses, such as the wall of the aorta. The whole subject bristles with difficulties, and the alleged impenetrability of the brain to arsenic seems to require further investigation. Moreover, evidence is accumulating that in general paralysis of the insane many spirochætes may be found in the perivascular sheaths or even within the lumen of the small vessels, in situations, that is to say, where theoretically they should be accessible. The second plea put forward by those who favour life-long treatment is that the patient would be worse without it. As regards general paralysis of the insane a defence of this kind is difficult to accept; possibly the use of tryparsamide may alter the position, but omitting from the argument a drug the effects of which, though promising, cannot yet be estimated, there is no convincing evidence that treatment with antisyphilitic remedies has any consistent effect in checking or aborting the disease. As least, the results since the discovery of 606 have not been sufficiently encouraging to obstruct the introduction of an entirely different form of therapy—viz., the non-specific. With regard to tabes, the complicating factors are so numerous and the results correspondingly difficult to estimate that dogmatism should be impossible. Unfortunately, it flourishes abundantly. From being an enthusiastic advocate of energetic arsenical treatment as a means of aborting the tabetic process and allaying its more unpleasant symptoms, I have become more guarded in my views and not a little sceptical. As regards the choice of drugs, I should now unhesitatingly vote for mercury, and it is surely no light matter to disregard the favourable opinion of mercury held by such experienced and prudent neurologists as Babinski and Nonne. Any opinion, however, of the extent of our ability to arrest or abort the disease is valueless unless it is realised that tabes frequently comes to a halt, often at an early stage, in those who have been treated (*a*) adequately, (*b*) inadequately, and (*c*) not at all. The doubt arises as to what extent, if any, groups (*a*) and (*b*) belong to group (*c*). The point might be settled by withholding treatment from large numbers of tabetics, particularly in the early stages, an experiment which, at the moment, I should regard as scarcely justifiable in view of my belief that to an extent which is appreciable, but not capable of more precise definition, the disease can be arrested or aborted by treatment with mercury.

Alterations in the blood and cerebro-spinal fluid Wassermann reactions are by many regarded as an

index to the efficacy of treatment. As between general paralysis of the insane and tabes the position is somewhat different. In the former both blood and cerebro-spinal fluid are strongly positive, are unaffected by specific treatment, and often remain positive during remissions. In general paralysis of the insane the spirochætes are confined to the nervous system, and are only exceptionally found in the other body organs; hence the positive blood reaction may be presumed to be an "overflow" from the brain. In tabes, on the other hand, the reaction in the blood is positive in only 70 per cent. of the cases, and in approximately the same number in the fluid. The blood reaction in tabes can be left out of discussion, as it may be due to visceral changes, such as aortitis, wholly outside the nervous system. Although many of the changes in the cerebro-spinal fluid in tabes (protein content, cells, colloidal gold curve) seem to be influenced by specific treatment, the Wassermann reaction is highly, but not completely, resistant. In many tabetics the fluid Wassermann reaction changes from positive to negative, irrespective of treatment, and once this has occurred it usually remains negative. Unfortunately, however, many tabetics with negative fluids get rapidly worse in spite of treatment, and many with positive ones remain stationary, irrespective of treatment.

For example, a patient of mine now aged 60 admits infection in 1894; he took mercury pills for a month and had no secondaries; his children, all under 20, are healthy; in 1909 Argyll Robertson pupils and absent knee- and ankle-jerks were accidentally discovered; at that time his blood was normal and his cerebro-spinal fluid abnormal (W.R.+), and he again took mercury pills for a month. He has never had any further treatment. In 1915 he came under my care with a gunshot wound in the thigh; in addition to the above signs he had some ulnar and lumbo-sacral analgesia, and his fluid was normal. It was again normal in 1919, and to-day—i.e., after 18 years—his condition is in statu quo and he has never had any symptoms of nervous disease.

Lightning pains and the various crises of tabes are sometimes regarded as evidence of the activity of the process, and therefore a signal for energetic treatment. This view is supported by the frequent exacerbations of the symptoms following injections of arsenical compounds. On the other hand, whatever may be the explanation of these phenomena—and in my experience gastric crises are among the most resistant to treatment of all tabetic symptoms—it is difficult to regard them as evidence of an active pathological process, seeing that they may persist for years, although the disease in all other respects is quiescent and stationary. The following case exemplifies this, and also illustrates another curious feature of the disease—viz., the beneficial effects on the course of tabes which may accrue from the development of a gummatous lesion.

G. K., aged 57, infected aged 23, treated with pills for a few months, no secondaries; aged 36, he began to suffer from severe rectal crises which have persisted with varying intensity to the present time. He was treated for fistula, fissure, dysentery, rectal bilharziasis (!) and was once threatened with an operation for carcinoma of the rectum. Later he became impotent, had slight urinary incontinence, suffered from lightning pains in his legs, and rapidly lost flesh; he was then told he had phthisis.

When examined, aged 49, he had Argyll Robertson pupils, absent tendon-jerks, profound sacral analgesia, and disturbance of postural sensation in feet. No visceral disease. W.R.++ in blood; C.S.F. W.R.+; globulin in excess, 18 cells per cubic millimetre. He was given a course of 2.25 g. of N.A.B. intravenously, followed by mercury pills for three years; his pains diminished but the rectal crises continued, although controlled by morphia suppositories.

Aged 50, blood W.R.−.

Aged 52, gummatous orchitis, W.R. blood++; 2·5 g. N.A.B., following which W.R. blood−. No treatment since except morphia suppositories, without which the rectal crises are "as bad as ever."

Aged 54 to 57, cerebro-spinal fluid and blood examined twice, both negative. He has put on weight and is better now in every way than he was 20 years ago, and the physical signs are unaltered.

NON-SPECIFIC THERAPY.

So unsatisfactory has been the response of late parenchymatous syphilis to the established methods of treatment, that we have been driven, so to speak, to desperate remedies. The first of these was intrathecal medication—i.e., the introduction of salvarsanised sera or small doses of arsenical compounds directly into the subarachnoid space, either spinal or cerebral or both. This method is now, we may hope, moribund, for apart from its dangers, of which I have had several unhappy experiences, it is based on the false assumption that the cerebro-spinal fluid is a lymph bathing the nervous parenchyma. The very opposite, however, is the case, since the fluid is probably a secretion of the choroid plexuses, possibly a dialysate, but certainly not a lymph, and, moreover, in its relation to the brain and cord it represents the way out rather than the way in, an effluent rather than an affluent. The second drastic step was the introduction of non-specific therapy, a method with which we are now becoming familiar in the shape of the malaria treatment of general paralysis. The beneficial effects of intercurrent febrile disease in general paralysis of the insane have long been recognised, but no systematic attack was made along these lines until Wagner van Jauregg began inoculating paretics with Koch's tuberculin in 1887. The tuberculin was succeeded by typhoid vaccine, then by various proteins, and finally, in 1917, by the blood of patients infected with benign tertian malaria. It may be too early yet to assess the true value of this method, but we must be careful not to prejudge it merely because it sounds fantastic and improbable. There can be little doubt that malaria treatment depends not on any specific effects of malarial infection as such, but rather on the general reaction of the organism to infection. In fact, the choice of malaria seems to have been guided more by chance and convenience than anything else. The whole question of therapeutic immunisation has recently been dealt with by McIntosh.

"In therapeutic immunisation two factors are at work, a specific and a non-specific. The specific is a typical antibody response, while the non-specific appears to be mainly dependent on a general stimulation of the tissues and leucocytes, in fact, to a process comparable to fever; in recent years there has been a greater tendency to make use of the valuable non-specific response."

According to a minority of investigators, the results of malaria therapy in general paralysis of the insane are better if combined with antisyphilitic treatment, on the assumption that the febrile process in some way "unlocks" the parasite and renders it accessible to the action of spirochæticides. It is claimed for the method that remissions are more numerous and lasting, and are associated with disappearance of the parasite from the brain as confirmed by autopsy. There appears to be no strict parallelism between the clinical improvement and the changes in the cerebro-spinal fluid. Gerstmann has recorded 33 per cent. of complete remissions out of 400 cases, many, it is true, in a very early stage of the disease, while of 209 cases treated in English institutions, nearly a quarter recovered sufficiently to permit of their being discharged. According to a report by the London County Mental Hospital Service, complete remissions occurred in about one-third of the cases in a mixed series, but in a much greater proportion, if only those cases with histories of less than 18 months' standing were treated. After making due allowance for the liability to long lasting remissions which may occur in untreated cases and also for the danger to life inseparable from the method, it is difficult to avoid the conclusion that, *if figures mean anything*, we are no longer justified in withholding malarial therapy from any case in the earlier stages of general paresis.

CONCLUSIONS.

1. The introduction of salvarsan and its allied compounds in the treatment of syphilis, other than

in the Wassermann negative primary stage, has not succeeded in protecting the human nervous system from syphilis; on the other hand, there is no evidence that it has increased neurosyphilis.

2. The influence of arsenical compounds in modifying the incidence, time of onset, and character of neurosyphilis remains to be determined.

3. The pathological changes which occur in the nervous system including its coverings, and in the cerebro-spinal fluid from the time of infection up to the development of late parenchymatous neurosyphilis, and the mutual relations which exist between these changes, are still largely a matter of conjecture.

4. The value of antisyphilitic treatment in arresting the progress of tabes and allied conditions is difficult to estimate owing to their liability to undergo spontaneous arrest.

5. The Wassermann reaction is not biologically specific, and its value as a guide to and indication for treatment cannot, therefore, be regarded as absolute.

6. The non-specific treatment of general paralysis has, according to the published figures, achieved better results than any previous method.

7. A majority of the unsolved problems of syphilis are intimately bound up with the increasing immunity to syphilis of the civilised peoples, together with the lack of any method by which this immunity can be estimated.

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Goulstonian Lectures
ON
CARDIAC DYSPNŒA.

The Second Goulstonian Lecture in 1927, delivered before the Royal College of Physicians of London on March 15th

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LECTURE II.*

CARBON DIOXIDE AND HYDROGEN-ION CONCENTRATION IN THE ARTERIAL BLOOD.

THE volume of carbon dioxide in the arterial blood can be measured directly. The method of Van Slyke (constant volume apparatus) has been used in this series. The volume of the gas is not, however, an indication of the pressure of the gas, since at a given volume the pressure will depend on the quantity of alkali available for combination with the carbon dioxide, and it is the pressure that is the effective stimulant to the respiratory centre. There is no satisfactory method for the direct determination of the pressure of carbon dioxide in the arterial blood, and indirect methods must be utilised. By determining the volumes of carbon dioxide that can be taken up by the blood at different pressures of the gas at the temperature of the body, and plotting the values so obtained, a carbon dioxide dissociation curve [25] is constructed. The pressure on this curve that corresponds to the volume of carbon dioxide in the arterial blood as actually determined should then be the pressure of the gas in the arterial blood. This curve is usually constructed from observations made with venous blood, and although venous blood may give a curve accurately representing the conditions in the arterial blood in normal healthy persons, it does not necessarily do so in conditions of disease. Morawitz and Walker,[26] and Meakins, Dautrebande, and Fetter,[22] have shown that venous blood has not the same carbon dioxide combining power as arterial blood in the presence of stasis. This factor is likely to be present in cases of heart failure, and Fraser, Graham, and Hilton [27] showed that the dissociation curves constructed with venous and with arterial blood in cases of heart failure are not identical. To obviate this fallacy, the dissociation curves in this series of observations have been constructed with arterial blood. It is obvious that the greater the number of points used in constructing the curve the more accurate will the curve be, and whenever possible four points have been used. This requires a considerable amount of arterial blood. The method of radial puncture, introduced by Hürter,[28] was found to be not sufficiently reliable for obtaining the necessary amount of blood, and so puncture of the femoral artery [29] has been introduced and utilised throughout these observations. By this method 50 c.cm. of arterial blood is easily obtained. The blood is oxalated, and sodium fluoride is added, as suggested by Lovatt Evans,[30] to prevent glycolysis. Even when thus constructed, the dissociation curve cannot be relied upon to give accurate values for the arterial carbon dioxide pressure, partly because four points are not sufficient if any one of them happens to lie a little off the curve of the other three, and partly because the changes undergone in blood from cases of diseased states when drawn and reheated in tonometers has not been sufficiently investigated. A second and additional method has, therefore, been employed in most of the cases. The pH of the arterial blood and of the samples of blood from the tonometers has been determined directly by the Hastings-Sendroy [31] colorimetric method. In this way the pH of the blood at different carbon dioxide pressures has been determined. The pH-carbon-dioxide-pressure curve has been constructed from them, and the pressure corresponding to the pH of the arterial blood found from the curve. Any alteration in the acid-base relationship of the blood after withdrawal from the body would result in changes in opposite directions in the values of the arterial carbon dioxide pressure obtained by the two methods. Thus, if the blood became more acid after withdrawal, the value obtained by the dissociation curve would be too high, and that by the pH-pressure curve too low. It is probable that the figure obtained from the dissociation curve is the more accurate, since the carbon dioxide volume can be determined with much greater accuracy than can the pH by the methods employed. By considering the figures so obtained an approximate value for the arterial carbon dioxide pressure is arrived at, and the figure obtained from the dissociation curve has been regarded as the more reliable of the two. When there has been a pronounced discrepancy between the figures obtained by the two methods, the results have been discarded.

CASES WITH MITRAL STENOSIS AND AURICULAR FIBRILLATION.

The results in the group of cases with mitral stenosis and auricular fibrillation are shown in Table V. In accordance with the practice of other

* Lecture I. appeared in THE LANCET last week.

observers, the amount of alkali available for combination with carbon dioxide, or the level of the dissociation curve, has been indicated by giving the carbon dioxide capacity of the blood at a pressure of 40 mm. of Hg. This figure is obtained from the dissociation curve, and will be accurate only in so far as the curve can represent truly the condition of the arterial blood.

TABLE V.

Carbon dioxide content and pressure, and hydrogen-ion concentration of arterial blood in same cases as in Table II.

Case No.	Date.	Dyspnœa.	Arterial blood.					
			CO_2 content.	CO_2 capacity at 40 mm. Hg.	CO_2 pressure.		pH.	
					From dissociation curve.	From pH pressure curve.	Colorimetric.	Calculated.
			V%.	V%.	mm.	mm.		
1	15/12/24	+	42·2	44	36	30	7·48	7·36
2	22/12/24	+ +	42·9	46	31	26	7·47	7·43
	12/ 1/25	-	55·6	59	33	31	7·33	7·52
3	18/ 6/23	+ +	35·7	44	26	—	—	7·44
	25/ 6/23	+	42·0	43	38	—	—	7·34
	9/ 7/23	+ +	41·4	46	32	—	—	7·41
	4/ 1/25	+ + +	33·6	45	21	17	7·46	7·50
	19/ 1/25	+	43·4	50	29	29	7·34	7·47
4	9/11/25	+ +	41·4	46	28	31	7·44	7·46
	7/12/25	+	43·2	47	32	31	7·37	7·42
	13/ 4/26	+ +	39·9	42	35	35	7·36	7·34
5	25/ 1/26	+ +	55·2	53	47	42	7·40	7·35
	8/ 2/26	+ +	56·0	52	48	42	7·33	7·35
6	8/12/24	Sl.	51·4	48	45	42	7·38	7·33
7	23/ 4/23	+	40·0	38	43	—	—	7·26
8	16/ 6/24	+	40·8	42	39	—	—	7·32

V% = Volumes per cent.

In health the limits of variation of the arterial carbon dioxide volume are wide. Harrop [18] found figures ranging from 44·6 to 52·9 volumes per cent. in ten healthy individuals. The amount of alkali available for combination with carbon dioxide as indicated by the carbon dioxide content at 40 mm. of Hg pressure, also varies greatly, and Peters, Barr, and Rule [32] conclude from their own observations and those of others that variations from 43·3 to 55·9 volumes per cent. with an average of 49·3 may occur in healthy subjects, though it is more constant than this in any one individual. The variations in arterial carbon dioxide pressure in health have been arrived at mainly by determination of the pressure in the alveolar air, which in health is almost identical with that of the arterial blood. Figures varying from 35·0 to 40·8 mm. of Hg. have been published,[32] but this method of determination is not available in diseased conditions and in cases of dyspnœa. Figures obtained from carbon dioxide dissociation curves have been published and show wider variations than these, but the dissociation curves were constructed from observations on venous blood. It is obvious, then, that much caution must be used in concluding that the figures for arterial carbon dioxide volume and pressure and capacity are indicative of significant departures from the normal in any single observation. Changes from one observation to another in the same individual under resting conditions will, however, be of greater significance.

The figures for the carbon dioxide content, as shown in Table V., are in general about the lower limit of the normal with certain obvious exceptions. In Case 3 the figures are clearly below normal limits on the first and fourth observations when the dyspnœa was particularly severe. In Case 2, while the figure obtained when the dyspnœa was present is at the lower limit of the normal, it is above the upper limit on the second observation when no dyspnœa was present. The one observation on Case 6 gives a figure near the upper limit of the normal at a time when the patient had greatly improved and only slight dyspnœa was present. Both observations on Case 5 gave values distinctly above the normal limits, and this is the case with low figures for oxygen saturation. In Cases 2, 3, and 4, in which two or more observations were made, it is seen that the figure is in each instance lower at the time of greater respiratory distress.

The values for the carbon dioxide capacity of the blood, as indicated by the volume at 40 mm. pressure, fall in general within the normal limits. Cases 7 and 8, and the third observation in Case 4, gave figures that are lower than the accepted normal or about the lower limit of the normal. At the second observation in Case 2 the capacity was definitely above the normal range, and in Case 5 the capacity was a high normal on both occasions.

The carbon dioxide pressures by either method are lower than the accepted normal values in Cases 2, 3, and 4, are within normal limits in Cases 1 and 8, and above the normal in Cases 5, 6, and 7. Cases 2, 3, and 4 are examples of severe cardiac dyspnœa uncomplicated by primary lung disease and in young subjects, so that the complications of arterial disease, renal insufficiency, emphysema, &c., are not likely to be present. In Cases 1 and 6 the dyspnœa was slight, and the patients had recovered considerably from the attacks of heart failure when the observations were made. Case 5 had evidence of pulmonary complications, and inefficient gaseous exchange in the lungs was demonstrated by the oxygen unsaturation of the arterial blood. In Cases 7 and 8 the patients are much older than the others of this group. In Cases 2, 3, and 4 several observations were made in states of severe dyspnœa and more pronounced failure, and in states of partial recovery. In Case 3 the second observation was made during recovery from the condition present at the time of the first observation, and the third during a slight relapse from overdosage with digitalis. The fourth observation was made during a subsequent admission to hospital because of a severe recurrence of the heart failure, and the fifth observation during partial recovery from this. The carbon dioxide pressures are lowest when the dyspnœa is most severe, and in each case the values rise towards or to normal in the recovery stage. In the two observations on Case 2 the pressure is higher in the recovered state. In Case 4 there are three observations. At the time of the first the dyspnœa and failure were severe, at the time of the second there was considerable recovery and the pressure is slightly higher. The third observation was made during a later admission to hospital when the patient's condition was much worse. The dyspnœa was severe and, notwithstanding this, the carbon dioxide pressure is within normal limits, suggesting that there was some impairment of the carbon dioxide exchange in the lungs. This patient died shortly after the observation was made, and the conditions were, therefore, not comparable to those present at the time of the earlier observations. If this one observation be omitted, the results in these three cases (2, 3, and 4) point to an association of a low arterial carbon dioxide content and pressure with severe dyspnœa, and to a lessening in the severity of the dyspnœa being accompanied by a rise in the carbon dioxide volume and of the carbon dioxide pressure. The carbon dioxide capacity of the arterial blood, although never below the limits of the normal, shows a similar if small rise with the rise of pressure and of volume that occur with recovery. The second observation on Case 2 shows a high figure for carbon dioxide capacity and a pronounced rise on recovery. The reason for this exceptionally high figure and the exceptional rise is not obvious. In the other observations on these cases the results are such as might be expected as a consequence of a low carbon dioxide pressure in the alveolar air from increased ventilation. Such a low alveolar pressure would result in a low arterial pressure and a low volume, and a readjustment of base would then take place, as Henderson and Haggard [19] have shown, with a lowering of the amount of base available for combination with carbon dioxide—that is, a lowering of the carbon dioxide capacity. If a similar mechanism is present in the

other cases also some other factor must be present to account for the different results in them.

In Case 5 the arterial carbon dioxide pressures are above the normal range, in spite of the severe dyspnœa and respiratory efforts. This points, in the absence of any signs of obstruction to the air passages, to a faulty exchange between the gases of the alveolar spaces and the blood or to insufficient ventilation of the alveolar spaces. Such an explanation is supported by the low oxygen saturation in the arterial blood. It will be noted that the carbon dioxide capacity is also high, as a result of the expected readjustment of base. In Case 6, in which the dyspnœa was but slight, a high carbon dioxide pressure is present, but the oxygen saturation is good. This could only be accounted for if there could be a degree of faulty exchange or ventilation sufficient to effect the efficient exchange of carbon dioxide, but not sufficient to affect the saturation of the blood with oxygen. That such a situation can arise is supported by the experimental work of Blalock, Harrison, and Wilson,[33] who found that in healthy lungs obstruction to ventilation may result in a rise of the carbon dioxide in the arterial blood before anoxæmia, as indicated by the oxygen saturation, is produced. As they point out, this is contrary to the conclusions of Hastings, Neill, Morgan, and Binger,[34] who based their findings on work on pneumonia. The same situation is present in Case 7, but in this case the dyspnœa was severe, the respiratory effort apparently keeping the ventilation sufficient to prevent anoxæmia, but not to maintain an efficient carbon dioxide exchange. In Cases 1 and 8, and on the third observation in Case 4, the carbon dioxide pressures are at high normal levels in spite of the pronounced respiratory efforts, and the same explanation will account for the difference between the results in them and in Cases 2 and 3, and the earlier observations in Case 4, in which the exaggerated respiratory efforts were accompanied by low arterial carbon dioxide pressures. The method of estimating the oxygen in the blood in terms of saturation is not entirely satisfactory. The pressure of the gas is the essential factor, and it is possible that the apparent discrepancies between oxygen and carbon dioxide exchanges would disappear if oxygen pressures were estimated throughout.

While Cases 5 and 6 illustrate the raised carbon dioxide capacities in the presence of high arterial carbon dioxide pressures, Case 7 had the lowest capacity in the series in spite of a pressure above the normal limits. This patient was aged 59, his arteries were thickened, and there were numerous granular casts in the urine, and the low capacity may be accounted for by an inability to readjust base owing to renal and other changes accompanying age and arterio-sclerosis. A similar inefficiency of readjustment, though less in degree, is seen in Case 8, aged 67, and in the third observation in Case 4 shortly before the patient died.

In this group of cases, therefore, we find that in the study of individual cases lower carbon dioxide pressures are found in arterial blood the more severe the dyspnœa, but that in some cases severe dyspnœa is accompanied by high pressures. It is clear, therefore, that this type of dyspnœa cannot in general be due to high carbon dioxide pressure in the blood supplied to the centre. The results are understandable, however, if there is some factor other than low arterial oxygen saturation or high arterial carbon dioxide pressure stimulating the centre to cause hyperpnœa. This hyperpnœa would then result in low arterial carbon dioxide pressures in the cases with free pulmonary ventilation and efficient gaseous exchange between alveolar air and blood, but might not be sufficient to lower the carbon dioxide pressure or to prevent a raised pressure in those cases in which pulmonary ventilation is obstructed or gaseous exchange with the blood inefficient. The congestion of the lungs and the œdema consequent on the heart failure are obvious possible causes for hampered ventilation and inefficient gaseous exchange.

Because of the retention of fixed acids, a raised hydrogen-ion concentration in the blood supplied to the centre is present in diabetic coma and in uræmia, and it is probably the cause of the hyperpnœa seen in these conditions.[35] In uræmia we have found low arterial carbon dioxide pressure, content, and capacity associated with normal oxygen saturation. The determination of the hydrogen-ion concentration of the arterial blood in cardiac dyspnœa is, therefore, of importance, since in it we find low carbon dioxide values and normal oxygen saturation. For convenience the logarithmic expression—the pH of Sörensen—has been utilised, and this has been determined for the whole blood in two ways. It has been calculated from the carbon dioxide volumes and pressures by the Hasselbalch formula according to the method of Van Slyke, Hastings, Murray, and Sendroy,[36] and it has been determined directly by the colorimetric method of Hastings and Sendroy.[31] The calculated values depend for their accuracy on the accuracy of the carbon dioxide dissociation curves, and will fail to represent the true arterial conditions in so far as these curves fail to do so. The direct determinations by the colorimetric method agree very closely in conditions of health with the values obtained by the hydrogen electrode, but considerable discrepancies have been reported in diseased conditions, and until the causes of these discrepancies are understood the calculated values are more reliable, although the colorimetric readings have the advantage of being independent of the determination of carbon dioxide contents or dissociation curves by means of which the calculated values are obtained. It is difficult to place the limits of the normal variations in arterial pH, and Austin [37] gives them as 7·30–7·50, though the variations in any one individual are almost certainly less than this. A study of the figures in Table V. shows that with only two exceptions the values all fall within these normal limits. The calculated pH on the second observation in Case 2, when the carbon dioxide capacity rose to an exceptional degree, is 7·52, which is more alkaline than the normal variations permit, but the colorimetric determination in the arterial blood is 7·33. In Case 7 the calculated value is 7·26, which is outside the limits on the acid side. Although the other values lie within the accepted limits, they are near the alkaline limits at the time of severe dyspnœa in Cases 2, 3, and 4, and are less alkaline in general on improvement. The values are near the acid limits in Cases 6 and 8. In Cases 6 and 8 the unusually high carbon dioxide pressures in the arterial blood are just compensated by the readjustment of base to avoid abnormal hydrogen-ion concentrations, but in Case 7, with pronounced arterio-sclerosis and renal changes, this compensation has failed. It is of importance to note that in Case 5 the carbon dioxide pressures are the highest in this group of cases, but high carbon dioxide capacity keeps the pH easily within normal limits. In Cases 1, 2, 3, and 4, with low carbon dioxide pressures, compensation by readjustment of base and lowering of carbon dioxide capacity is successful in keeping the pH within the limits of the normal on the alkaline side. This group of cases, therefore, shows that so far from severe cardiac dyspnœa being accompanied by increased hydrogen-ion concentration in the arterial blood, normal values are the rule, and there may be a lowering of the hydrogen-ion concentration to the alkaline limits of the normal with a rise later as the severity of the dyspnœa diminishes.

CASES WITH HIGH BLOOD PRESSURE AND ARTERIAL DISEASE.

The results of the observations on the carbon dioxide and hydrogen-ion concentration in the second group of cases are recorded in Table VI. This group consists of the six patients who had dyspnœa and heart failure with high blood pressure and arterial disease, but no evidence of endocarditis. The volume of carbon dioxide in the arterial blood is below the limits of the normal variation in four (10, 11, 12, and

14) of the six cases, and about the lower limit in Case 9. The second observation on Case 13 is the only figure well inside the normal limits, and this is the case in this group that showed the low oxygen saturation of 87·8 per cent. (see Table II.). In the second observation on Case 10 the volume of carbon dioxide is only 27·6 per cent., the lowest in the whole series, but this observation was made a few hours before the death of the patient. The carbon dioxide capacity is, in general, within the accepted limits of the normal, except at the second observation on Case 10 just before the death of the patient, and at the first observation on Case 13, when the failure was extreme. In these instances the figures are too low, presumably from faulty elimination of fixed acids. In Case 13 the capacity rose as the general condition of the patient improved. As in the group of cases with mitral stenosis, the carbon dioxide pressures in the arterial blood are generally below the normal values. Case 13 is the one exception, for at the two earlier observations the pressures are markedly high, and at the third, when the patient was greatly improved, the pressure had come down to a normal value. The low oxygen saturation (see Table II.) and high carbon dioxide pressures in this case are exceptional, and point to an inefficient gaseous exchange from œdema of lung tissue. This prevents the effect of the hyperpnœa on the arterial blood which is observable in the other cases. The hyperpnœa in the other cases must be the result of some respiratory stimulus other than low saturation or high carbon dioxide pressure in the arterial blood, and it causes in this group of cases, as in the group with mitral stenosis, a washing out of carbon dioxide from the lungs with low figures for arterial carbon dioxide pressure, capacity, and volume. That the respiratory stimulus is not increased hydrogen-ion concentration is seen on examining the figures for the pH in Table VI., for they fall within the normal limits with three exceptions. On the second observation on Case 10, shortly before the patient's death, the calculated pH is too acid, and on the first observation in Case 13, when the failure was extreme and the arterial carbon dioxide pressure high, the value is outside the normal to the acid side, and with recovery more alkaline values were obtained. In Case 11 the calculated pH is outside the normal range on the alkaline side. In Cases 9 and 12 the hydrogen-ion concentrations are in the alkaline half of the normal range. In this group, therefore, as in the group of mitral stenosis cases, there is no indication of retention of acid bodies as the cause of the dyspnœa except in the patient with extreme failure and faulty exchange of gases in the lungs, and in the observation of Case 10 a few hours before the death of the patient.

TABLE VI.

Carbon dioxide content and pressure, and hydrogen-ion concentration of arterial blood in same cases as in Table III.

Case No.	Date.	Dyspnœa.	Arterial blood.					
			CO_2 content.	CO_2 capacity at 40 mm. Hg.	CO_2 pressure.		pH.	
					From dissociation curve.	From pH pressure curve.	Colorimetric.	Calculated.
9	28/ 9/25	+	43·7	49	31	29	7·38	7·44
	31/11/25	+ +	44·9	49	31	30	7·45	7·44
10	24/11/24	+	38·8	43	33	31	7·31	7·36
	1/12/24	+	27·6	31	27	27	7·34	7·29
11	5/10/25	+	39·2	48	24	24	7·43	7·52
12	11/ 2/24	+ P.	39·9	44	30	—	—	7·42
	25/ 2/24	+ Sl. p.	37·1	43	29	—	—	7·41
	17/ 3/24	Sl.	38·8	45	28	—	—	7·44
13	28/ 1/24	+ + +	45·1	42	48	—	—	7·26
	3/ 3/24	+ +	51·8	46	51	—	—	7·31
	31/ 3/24	+	44·0	46	36	—	—	7·39
14	21/ 6/26	+	39·0	43	32	35	7·37	7·36

Sl. p. = Slightly periodic.

CASES WITH PULMONARY DISEASE IN ADDITION TO HEART FAILURE.

The results in the three cases with pulmonary disease and the two unclassified cases are shown in Table VII. The volumes of carbon dioxide in the arterial blood are all high, either around the upper limit of the normal or definitely above as in Case 17, and the first observation in Case 15. The carbon dioxide capacities are higher than in the other groups, and in Case 17 it is definitely above the limits of normal variation. The carbon dioxide pressures are around the upper limit of the normal in Cases 18 and 19, and markedly above the normal in all the other observations, with the exception of the second observation on Case 15. In Case 17 and in the third observation on Case 15 the pressures could not be determined with any accuracy, as the arterial point lay beyond the ascertained range of the dissociation curve, and could only be arrived at by extrapolation. That the pressures were abnormally high is, however, undoubted. At the second observation on Case 15, when the figures for the pressure were below the normal range, the patient's condition was greatly improved, and he was quite free from signs of bronchial spasm which were present at the other observations, though orthopnœa and signs of heart failure were still evident. This group is characterised, then, by high carbon dioxide pressure in the arterial blood, with normal or high capacity and high carbon dioxide volumes. This high carbon dioxide pressure in the presence of dyspnœa is accountable on the pulmonary lesions present in Cases 15, 16, and 17. In Case 18 it may be due to the holding of the breath that was noticeable in the presence of the paroxysms of pain of angina pectoris. In Case 19 the general feebleness of the patient with carcinoma of the uterus might conceivably account for it. The low pressure at the second observation in Case 15 would appear to indicate that in the absence of the bronchial spasm this case is essentially the same in the mechanism of the dyspnœa as the cases in the other groups, and it is probable that in so far as the cardiac dyspnœa is concerned there is a mechanism common to all the cases, though the evidence of it may be obscured in some by such complicating factors as pulmonary disease.

TABLE VII.

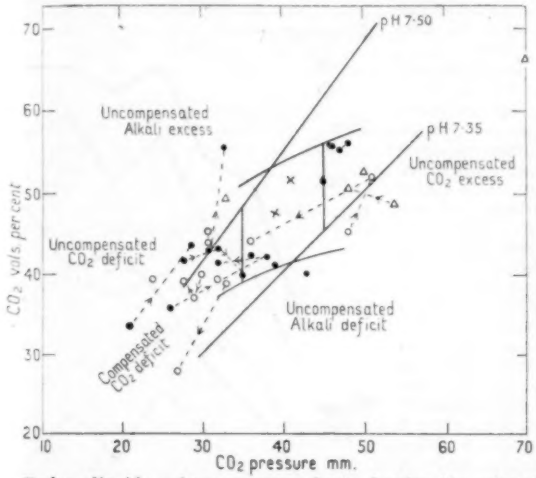
Carbon dioxide content and pressure, and hydrogen-ion concentration in same cases as in Table IV.

Case No.	Date.	Dyspnœa.	Arterial blood.					
			CO_2 content.	CO_2 capacity at 40 mm. Hg.	CO_2 pressure.		pH.	
					From dissociation curve.	From pH pressure curve.	Colorimetric.	Calculated.
15	15/ 6/25	+ +	57·8	—	—	—	—	—
	29/ 6/25	+	49·6	53	33	28	7·33	7·48
	15/ 2/26	+ + +	47·8	44	54*	40	7·42	7·23*
	22/ 2/26	+	50·5	47	48	41	7·40	7·27
16	7/ 6/26	+	52·4	48	50	—	7·42	7·30
17	19/10/25	+ +	66·9	59	70*	—	7·37	7·26*
18	18/ 1/26	+	47·3	48	39	34	7·35	7·37
19	12/10/25	Sl.	51·4	51	41	39	7·42	7·38

* Figures uncertain since that for CO_2 pressure was obtained by extrapolation.

In view of the high carbon dioxide pressure, it is not surprising to find hydrogen-ion concentrations, as indicated by the calculated pH, that are abnormally high in Cases 15, 16, and 17. In Cases 18 and 19 values in the acid half of the normal range were found, and at the second observation on Case 15 a concentration towards the alkaline limit of the normal. It is seen that in this group the colorimetric pH values differ considerably from the calculated, and all lie within the normal range. It is not possible to say which are the more accurate, in view of the profound disturbance of the acid base balance that is present; but the calculated values cannot be so

accurate in these cases as in the others, because of the extreme position of the arterial points in the dissociation curves. In the presence of the high carbon dioxide volumes and pressures in the arterial blood, the existence of a gaseous acidosis can be accepted.



Carbon dioxide volume-pressure chart, showing the arterial points in Cases 1–19. The continuous lines enclose the normal area.

• Cases 1–8. o Cases 9–14. Δ Cases 15–17. × Cases 18 and 19.

The arterial points for the 19 cases of the three groups have been placed on a carbon dioxide volume-pressure chart. The area of normality, adapted from the chart of Hastings, Neill, Morgan, and Binger,[3,4] is shown, and it is seen that most of the arterial points are grouped in the areas representing compensated and uncompensated carbon dioxide deficit. The points from the cases with pulmonary disease in addition to heart failure and from Case 13 lie towards or in the area of uncompensated carbon dioxide excess; those from Case 7 and the second observation in Case 10 are in the area of uncompensated alkali deficit, and that from the second observation on Case 2 in the area of uncompensated alkali excess. The chart shows well that unless other factors are present in addition to heart failure, and so long as pulmonary congestion is not extreme, cardiac dyspnœa is accompanied by a condition in the arterial blood indicative of compensated or uncompensated carbon dioxide deficit, which is presumably the result of increased pulmonary ventilation.

Conclusions on Carbon Dioxide and Hydrogen-ion Concentration in Arterial Blood.

The study of arterial blood in these 19 cases of cardiac dyspnœa permits of the conclusions that (*a*) in cases of extreme congestive failure and of pulmonary disease in addition to heart failure, faulty elimination of carbon dioxide and faulty absorption of oxygen in the lungs may be factors in the production of increased respiratory activity; and (*b*) in cases near death, retention of fixed acids, and raised hydrogen-ion concentration may be factors in the production of increased respiratory activity, but that (*c*) in cases of cardiac dyspnœa other than these the condition of the arterial blood cannot account for the dyspnœa, and is, indeed, indicative of the presence of increased pulmonary ventilation to which the changes in the arterial blood are secondary. Since the changes in the arterial blood due to the conditions (*a*) and (*b*) would mask the effect of such increased ventilation, it is reasonable to suppose that there is a cause of increased respiratory activity present in all cases of heart failure, which is independent of the quality of the blood supplied to the respiratory centre.

(*The bibliography, to which references are given in this lecture, will appear with the third lecture.*)

THE CHLORIDES OF GASTRIC CONTENTS

IN RELATION TO FREE ACIDITY.

By SINCLAIR MILLER, M.D. Belf.,
AND
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Since the publication by Ryle in 1920[6] the fractional method of gastric analysis as described by Rehfus and Hawk has found wide application in clinical work in this country, and much information is now available about the range of variation of gastric acidity in health and disease.

Although it has long been accepted that the total chloride content is the more accurate index of the secretory activity of the stomach, records of such estimations by the fractional technique are relatively few, the most important being those of Bolton and Goodhart.[3] These writers based their observations on 70 cases, and accepted the opinion of Boldyreff that the balance of muscle tone between the stomach and the pylorus is a most important factor in defining the degree of gastric acidity. One of the results of the action of the pyloric sphincter is the control of the regurgitation of alkaline fluids to the stomach from the duodenum. Bolton and Goodhart confirm the view that the total chlorides are a more accurate index of secretory activity and that the inorganic chlorides are a fair index of the degree of access of alkali to the stomach, mainly from the duodenum. In 1924 Baird, Campbell, and Hern[1] published results of chloride estimations in fractional samples, and, on the evidence of simultaneous withdrawal of duodenal and gastric contents after test-meals, conclude that production of alkaline secretions by the stomach itself is at least as important a factor in control of gastric acidity as regurgitation of pancreatic and duodenal contents. These writers also describe a method by which the estimation and calculation of the chlorides become practicable for routine clinical work.

Our routine has been to estimate the chlorides in all fractional gastric analyses. This communication is a survey of such estimations in 22 cases of Addison's anæmia and in 292 unselected cases of other diseases. The technique for the test-meal is that outlined by Ryle.[6] In approximately half of the cases examined by us the chlorides have been estimated by the complete Volhard method by fusion with and without alkali, and in the other half by the shorter and simpler method described by Baird, Campbell, and Hern, the accuracy of which for clinical purposes we have confirmed. Defining a unit of free acidity against Töpfer's reagent or of chlorides as the equivalent of 1 c.cm. of N/10 HCl per 100 c.cm. of gastric contents, we have grouped our cases as follows:—

1. Achlorhydria: Free HCl absent in the resting stomach and throughout the test.
2. Hypoacidity: Free HCl not greater than 10 units at any time after the administration of the meal.
3. Normal acidity: Free HCl greater than 10 units but not greater than 50 units after the meal.
4. Hyperacidity: Free HCl greater than 50 units at some time after the meal.

The following table shows the incidence of these groups of free acidity within the series, as well as the number of estimations of chlorides carried out at the various intervals of time in the course of digestion and passage of the meal.

The chlorides of the meal itself have been estimated repeatedly and found to vary from zero to 5 units, a negligible quantity in the interpretation of results. Saliva expectorated during the test has been examined in 25 cases; in no case was free HCl present. The total acidity to phenolphthalein varied from 0 to 10 units, the average being 5 units and the total chlorides from 10 to 55 units, the average being 20 units. Allowance must therefore be made in

considering the total chlorides of the fasting contents of the stomach, which naturally may include an appreciable amount of saliva. This also emphasises the importance of taking precautions to exclude the swallowing of saliva after administration of a test-meal if the chlorides are to be estimated.

A. = Achlorhydria (Addison's anæmia). B. = Achlorhydria (other diseases). C. = Hypoacidity. D. = Normal acidity. E. = Hyperacidity.

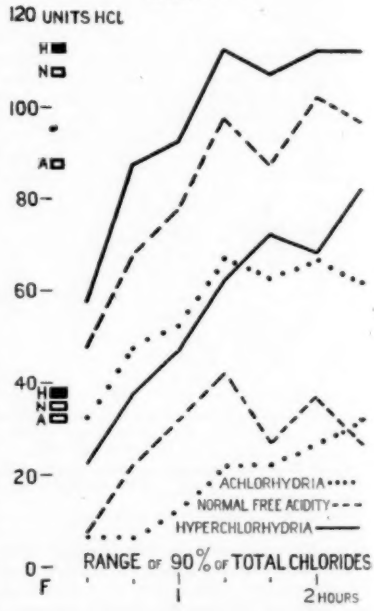
—	No. of cases.	Number of analyses. Hours after meal.									
		0	½	¾	1	1½	1¾	2	2½	2¾	3
A.	22	16	18	16	7	7	5	4	2	2	
B.	56	42	38	25	29	18	22	7	10		4
C.	19	10	11	8	9	6	4	5	3		
D.	181	113	113	70	107	62	72	39	26	11	9
E.	36	21	23	12	23	9	17	4	6		
Total	314	202	203	131	175	102	120	59	47	13	13

The results of the estimations of chlorides indicated in the above table are expressed in two schemes of diagrams: (1) mean curves, representing the average figures at stated periods of time of digestion (Figs. 1 and 2); (2) curves defining the limits of 90 per cent. of the results (Figs. 3 and 4). There is obvious general conformity in the shape of the average curves of total chlorides in all groups. The total chlorides tend to return to the level of the resting contents of the stomach.

The height of the curve of total chlorides places the various groups in an order of magnitude corresponding with the degree of free acidity (Fig. 1). The appreciably high level of the total chloride curve in Addison's anæmia and other cases of achlorhydria shows that even in this group the secretion of HCl is appreciable but neutralised by chlorides in the various groups of acidity show only slight divergence, evidence that the absence of free HCl is most often due to access to the stomach of alkaline secretions, neutralising what may be potentially an appreciable degree of free acidity.

In all groups excepting that of hyperacidity the average curves of inorganic chlorides are broadly similar in shape to those of total chlorides, though at a lower level (Figs. 1 and 2); there is in both total and inorganic chlorides a rise in the curve within 40 minutes of taking the meal, and a tendency to return to the level of the fasting contents. The former feature suggests that some secretion of alkali by the stomach is excited in almost immediate response to the meal. Bennett and Dodds[2] demonstrated a correspondence between the curves of free acidity in the stomach and those of the pressure of CO_2 in alveolar air, and their published records provide some evidence that some output of alkali

FIG. 3.



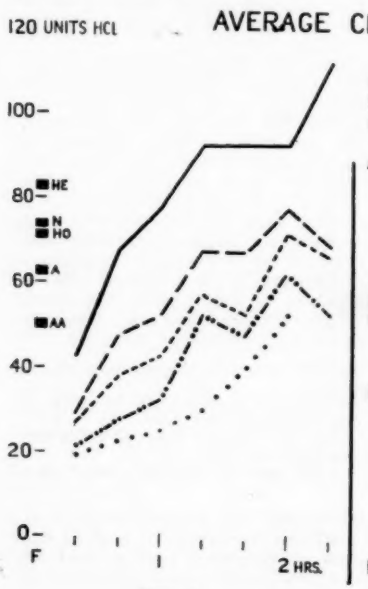


FIG. 1.
Total chlorides.

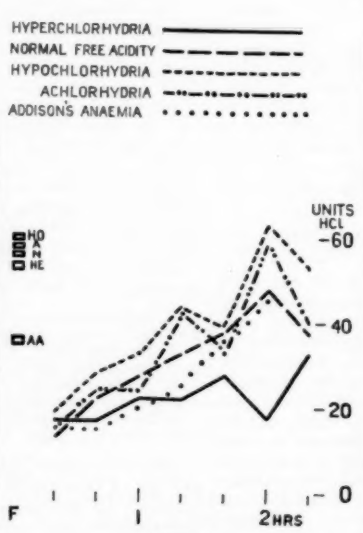
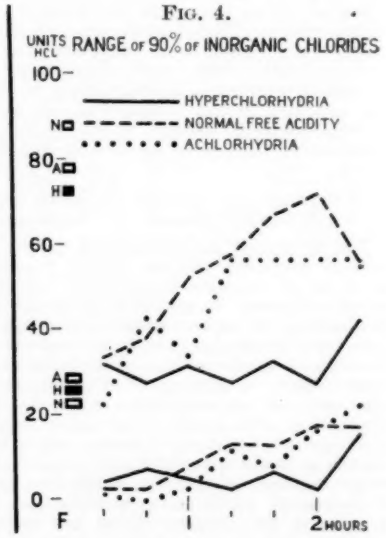


FIG. 2.
Inorganic chlorides.

FIG. 4.



alkali. This fact is also demonstrated in Fig. 3 where the range of total chlorides in achlorhydria of other diseases than Addison's anæmia is seen to fall mainly within that for the group of normal free acidity, and even includes a portion of the zone covered by cases of hyperacidity. The average curves and the range of 90 per cent. of the inorganic from the circulation commences about the same time as the arrival of food in the stomach. In the case of hyperacidity the curve of inorganic chlorides remains almost horizontal at a distinctly low level up to two hours; there is a tendency to rise after two hours, but to a level appreciably less than in other groups. This fact suggests that the secretion of alkali by the

stomach is markedly deficient or delayed in this group.

Figs. 1 and 2 show clearly the association between deficient alkaline secretions and hyperacidity. The same point is brought out in Figs. 3 and 4, where a considerable proportion of cases with a normal range of free acidity are seen to have a range of total chlorides as high as many cases of hyperacidity, whereas the inorganic chlorides in cases of normal acidity are very much higher than those of hyperacidity.

The total and inorganic chlorides of the fasting contents of the stomach have a remarkably constant average in all groups of free acidity, the widest divergence being found in Addison's anæmia. In Addison's anæmia it is interesting to note the similarity of the shape of the average curve of the chlorides to that of other groups, the difference being only that of reduction in magnitude. The range of variation of the total chloride curves in Addison's anæmia falls within the zone of the curves of 90 per cent. of the cases of achlorhydria in other diseases. On the basis of the figures for the total chlorides there is no indication of any possible definition of so-called achylia as distinct from achlorhydria. The feature of the results of fractional test-meals in cases of Addison's anæmia is the rapid disappearance of starch from the stomach. In 16 (66 per cent.) of the 24 test-meals in cases of Addison's anæmia starch had disappeared from the fractional samples in one hour. In the cases of achlorhydria other than Addison's anæmia the proportion empty in one hour is 35 per cent. In the few fractional samples available in cases of Addison's anæmia after one hour the chlorides tend to rise, but at a slightly lower level than other cases of achlorhydria, an indication that a certain amount of HCl is secreted, but neutralised by alkali and absorbed by protein.

Summary.

1. The mean curves of total chlorides in all grades of gastric acidity are similar in shape, differing only in magnitude. 2. The mean curves of the inorganic chlorides have the same general form and relation to time of digestion as those of the total chlorides, but agree much more closely in magnitude. In hyperchlorhydria the inorganic chlorides tend to remain low or rise only very slightly. 3. On the basis of the figures of the chlorides there seems to be no clear definition of the so-called achylia of Addison's anæmia, as distinct from other cases of achlorhydria.

We wish to express our thanks to the honorary physicians of the Royal Bath Hospital for the use of their notes and permission to examine the cases; also to S. Linfoot for his technical assistance.

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3. Bolton, C., and Goodhart, G. W.: THE LANCET, 1922, i., 420.
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BRIGHTON AND HOVE PROVIDENT DENTAL HOSPITAL.—At the annual meeting on Feb. 28th it was decided to convert the hospital into a corporate body by registering it as a company with limited liability, without the addition of the word "limited" to its name. The decision was unanimous, and the licence of the Board of Trade is to be sought. It was explained that the hospital had now a fairly large amount of invested funds which were in the hands of trustees; but it was felt that an institution of that kind should be master of its own funds, and that it should be an incorporated body, having a definite legal status, not dependent on cumbersome and obsolete trusts, and protecting its members from financial liabilities beyond those laid down. The annual report showed a decrease of 435 patients during the year; this was explained as due to the fact that the State, through the approved societies, was now providing dental benefit, formerly only available through charity.

POST-PARTUM AVULSION OF THE UTERUS:

A CASE OF RECOVERY.

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With Remarks by

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OBSTETRIC PHYSICIAN TO ST. THOMAS'S HOSPITAL.

THE following case is of interest as it reveals how completely a woman may recover from the effects of so serious a disaster as the tearing out of the whole uterus after delivery.

On July 7th, 1926, a letter was received at St. Thomas's Hospital from a practitioner asking for the admission of a patient, a multipara, aged 30, who had been delivered of her fifth child three days previously. The four previous confinements had been normal except the last, in which the placenta was removed manually. In addition there had been two miscarriages.

The medical man had apparently been called in when labour was well advanced. He found a breech presentation. The membrane ruptured early and a full-time living child, stated to be 12 lb. in weight, was born after a normal labour of 18 hours. There was some delay in the birth of the placenta and when it did come (to quote the doctor's letter) "the uterus, placenta, and a tumour were so inextricably mixed up and the neck of the uterus so friable, that I removed them all." Unfortunately, this unusual specimen was thrown on the fire and so destroyed. The method of removing the mass was to cut through such attachments as remained with scissors. It was on the third day after delivery that the doctor made his request for the admission of the patient, which was arranged for at once.

On examination after admission the temperature was 99° F., the pulse-rate 120, and the respirations 24 per minute. The patient looked extremely pale and feeble. She did not complain of great pain, but had a certain amount of abdominal discomfort together with severe thirst. The abdomen was slightly distended in the lower part and tender, and no uterus was palpable. There was a blood-stained discharge, not much more in amount than the normal lochia, and not offensive.

As there was no hæmorrhage and it was three days since delivery, the patient was merely given a sedative and propped up in bed. On the following day she had a much more anxious appearance and complained of abdominal pain. The temperature was 98°. A constant flow of bright blood per vaginam, accompanied by a rise in the pulse-rate, indicated the need for further investigation. An anæsthetic was given and examination by speculum made with the patient in the lithotomy position. At the top of the vagina was a ragged hole, which was gently explored when coils of gut were made out lying above. On the right of the tear was a piece of decomposing muscular tissue about 1 inch square, apparently all that remained of the uterus. From its attachment to the vagina it was thought to be the remains of the cervix and was removed for microscopy. The report returned was that it showed necrosis of tissue with enormous dilatation of vessels and extreme congestion, but that its histological structure could not be determined (Prof. L. S. Dudgeon). The hole in the vault and the vagina were lightly plugged with gauze wrung out of 1 in 1000 formalin solution and the patient put back to bed. There was no further bleeding and the plug was removed four days later. The patient was discharged on July 30th, having made an uneventful recovery.

She was seen again on Nov. 12th and found perfectly well and able to do her work. There was no pain or tenderness in the abdomen and no trouble with the bowels. There was no discharge, and on vaginal examination the tear was found to have healed up leaving a puckered scar in the vault.

Discussion.

It is unfortunate that the specimen as removed was not available for examination, as it would have been interesting to have been able to give a description of the "tumour." Probably there was complete inversion of the uterus with extensive laceration of the vagina, so that traction on the placenta while it was

still attached to the uterus would result in further tearing and separation of that organ from its surrounding structures. The removal would then be completed by the scissors as described by the practitioner.

The most striking feature is the absence of serious and rapidly fatal hæmorrhage in consequence of the tearing of the vessels, the retraction of which would be readily permitted by the loose nature of the pelvic cellular tissue which is characteristic of late pregnancy. The low blood pressure resulting from the shock of the avulsion might be a contributory factor.

Apart from early death from hæmorrhage or shock (or the two together), the other danger is that of the development of general peritonitis. The risk is not, however, as great as might be thought, for the state of affairs differs little from that in vaginal hysterectomy, such as used to be performed for uterine cancer with its foul ulcerating surface. General peritonitis was a rare complication of vaginal hysterectomy for cancer, although the chances of infection were much greater. In this case there probably was nothing more than a slight pelvic peritonitis—the signs of which decided the practitioner in charge to ask for the patient's admission to hospital. All that was found on examination was slight distension and tenderness of the lower part of the abdomen. In the absence of any indications for interference, the patient was merely propped up in the Fowler position, and had it not been for the bleeding that began on the following day nothing further would have been done. The fresh hæmorrhage made thorough investigation necessary. Only slight oozing was discovered which was readily controlled by a gauze plug.

Remarks by Dr. JOHN S. FAIRBAIRN.

The chief interest in cases of avulsion of the uterus after labour is a forensic one, because rare though they are, sufficient numbers are recorded in medical literature to show that the disaster may occur without evidence of undue force being used or of anything that necessarily involves criminal negligence.

There are two papers easy of access in which details of other cases may be referred to. The first is by the late Mr. J. Hopkins Walters, of Reading, on Post-partum Avulsion of the Uterus, with a case, followed by Recovery,[1] and the other is by Dr. Herbert R. Spencer on Rupture and Avulsion of the Uterus at the Time of Labour,[2] in which seven cases of recovery without operation are recorded. The latter paper was published after the quashing by the Court of Appeal of the conviction of a medical man for manslaughter in a case in which this accident had occurred. The report of the proceedings in the High Court of that trial showed that the judge and jury were both unconvinced by the medical evidence that this accident might occur without great violence being used, and still more by the evidence that once it had occurred the proper treatment was to leave things alone unless there was hæmorrhage or other urgent reason for interference.

A study of these recorded cases brings out certain points that are worth while recapitulating, because at any time criminal negligence or even a charge of manslaughter may be brought against medical practitioners or midwives who have been in attendance on the patient.

The main point is that rupture of the vagina may occur spontaneously without internal manipulations; once started, the tearing may readily extend into the loose cellular planes around the cervix and lower uterine segment, and result in the complete separation of the uterus from the bladder and pelvic wall through the base of the broad ligament. If the placenta is adherent or its separation and expulsion delayed, and a hand is passed up for its extraction, the detachment of the uterus may be readily effected if the extensive vaginal laceration is not immediately recognised—by no means an easy matter at the end of labour. Should, in addition, there be inversion of the uterus—whether spontaneous or the result of efforts at expression of the placenta—diagnosis is rendered much more difficult, because this rare and unexpected accident is frequently mistaken for a tumour, as is surmised to have happened in the case now recorded. In one of the German cases in which a doctor was called in after the midwife had attempted to remove the after-birth manually and found the patient bleeding and collapsed, he found a large body, round which he could move his hand without feeling any adhesions and, being in doubt as to what it was, brought it out and found it was the uterus and appendages attached only to the vagina at a few points. The patient recovered. The unfortunate practitioner was suspended from practice and imprisoned for some months by the wisdom of the Teutonic law, whilst the midwife, clearly the cause of the disaster, escaped. The most remarkable case is that recorded by Cooke in 1835 (Walters's paper, p. 250). The labour was protracted (63 hours) and there was considerable hæmorrhage during the following night; 33 hours after the spontaneous delivery of child and afterbirth, the midwife was recalled because the patient had got out of bed to pass water, had screamed, and called for assistance, and was discovered sitting on a stool with a large substance between her thighs supported by her hands. When the midwife arrived the patient was in bed, the large substance was connected by a shred of membrane only, was removed, and was found by the recorder of the case to be the inverted uterus with all its appendages, except the left ovary. The patient survived without further treatment. The explanation given of this case is that the inverted and partially separated uterus was expelled during straining at stool; further separation occurred from the drag of the dependant mass while the patient was got back to bed, and the midwife's story, supported by husband and relatives, that only a few membranous tags remained, is accepted as reliable.

Another trial for manslaughter in this country is quoted by Walters (Popplewell, 1868), and in the discussion subsequent to the reading of his paper he said, in reply, that no penal action was taken against the midwife responsible for the case he recorded, and that he was thankful this was so, as he would at the time have given much stronger and more positive evidence against her than his further study of the subject would have justified.

These disasters are happily so rare that even those of us with the widest hospital experience are unlikely to meet with more than an occasional case, so that evidence based on personal knowledge alone will not be convincing to the court, as is shown in the report of the manslaughter trial at the end of 1924.[3]

This record and references to others are made in the hope of lessening the chances of another verdict like that in the case just mentioned.

[1] Trans. Obst. Soc. Lond., 1884, xxvi., 233.
[2] THE LANCET, 1925, i., 425.
[3] THE LANCET Special Supplement, Feb. 14th, 1925.

EXTENSION OF HOSPITALS.—The Blackpool Victoria Hospital is to be renovated and enlarged at a cost of about £100,000. Additional accommodation will be provided for approximately 200 patients, and a ward for paying patients is included in the scheme.—The sum of £20,000 is to be raised to equip the Chester Infirmary with apparatus for the treatment of cancer. The adjacent counties of Cheshire, Flintshire, and Denbighshire will be invited to coöperate.—The first block of the new Bradford Royal Infirmary at Daisy Hill is to be begun at once. The cost of the whole institution will be about £500,000. It has been stated that there is no town or city in England in which the workers subscribe a larger sum per head than they do in Bradford to the hospital and convalescent fund. Last year £20,000 was raised amongst the workers for distribution to the voluntary hospitals, and 1100 people were sent to convalescent homes.—A fund is to be opened for the remodelling of Denbigh Infirmary, which is one of the oldest hospitals in North Wales.

ON THE VALUE OF PRESENT METHODS OF TREATING LEPROSY.*

BY H. W. WADE, M.D. TULANE,
AND
C. B. LARA, M.D. MANILA,
CHIEF PATHOLOGIST AND CHIEF PHYSICIAN, RESPECTIVELY, CULION LEPER COLONY, PHILIPPINE HEALTH SERVICE.

IT is now many years since the outlook in leprosy work was such that there seemed little hope of finding an effective treatment. Various drugs were reported as beneficial, but few gave any apparent cures, and there was usually doubt lest these were but temporary retrogressions, or if permanent, were due to factors other than treatment. At present, those actively engaged in or familiar with modern leprosy work on a large scale have, as a rule, a much less pessimistic outlook. However, from others one occasionally hears expressions reminiscent of the cheerless past. It may be well, therefore, to take stock, to inquire whether one's own more optimistic view is really justified.

Because the anti-leprosy work in the Philippine Islands is so largely an attempt at eradication and treatment, and because it was here that what may be considered the transition period began with the Heiser-Mercado treatment, it may be of special interest to compare as well as we may the results now being obtained with those of the recent past. In this connexion certain other pertinent matters will be touched on.

Definition of "Leper."

The term "leper" is often applied without qualification to cases that are of three main classes. It has long been applied by some to anyone who shows evidence of ever having had leprosy, whether the actual disease still exists or not. In the asylums of some regions the old, crippled "ex-lepers" are particularly conspicuous. For all scientific purposes such cases should be distinguished from those with the active disease.

Of the latter there are two groups. In those most commonly seen the bacilli can be demonstrated. Only such cases can be held for segregation under Philippine regulations, and Philippine reports have dealt almost solely with such cases. Because of the degree of advancement when first seen, these are at best only fairly favourable material for treatment, and usually they are decidedly otherwise.

The other group, which has recently begun to receive due attention largely because of Muir's insistence, comprises those who present only clinical evidences of the disease. Such persons we prefer to call "suspects," or when the diagnosis is reasonably certain, "clinical lepers."

When these basic distinctions are not used, it is impossible fairly to compare different reports on treatment work. The results obtained, should suspects and clinical lepers be recorded unqualifiedly as lepers, may be expected to be comparatively spectacular, which may unnecessarily excite incredulous scepticism in the minds of physicians who treat only bacteriologically positive cases. There is, of course, greater possibility of error in diagnosing the bacteriologically negative group, though with careful, properly trained workers this is not important.

Previous System and Treatment.

At the time of the opening of the Culion Leper Colony in 1906, lacking a reasonably effective treatment, the only available anti-leprosy measure was segregation of bacteriologically positive cases. It were out of place here to discuss at length the effectiveness of this measure. Suffice it to quote the following official statement:—

"Revenges and anonymous letters are the best sources of information to localise detected cases of leprosy, though some lepers are identified in fiestas and sometimes in the public dispensaries."[1]

While this statement is probably too sweeping, it nevertheless has an important basis of fact, which is to be considered in connexion with claims of critics of the segregation measure that this has been applied intensively and ruthlessly.

Until recently treatment has been an unimportant factor in the eradication campaign in the Philippines, if indeed it was a factor at all. Of the earlier treatment work here only a few points need be touched on. In 1908 Heiser introduced, both at Manila and Culion, Dyer's method of using chaulmoogra oil by mouth. A number of patients became negative, but it is stated that none remained so for two years. Injection experiments were unsatisfactory until the development of the well-known mixture of Mercado, who was house physician at the San Lazaro Hospital, Manila. Several cases having become negative, systematic work was begun early in 1912,[2] and the treatment was shortly introduced at Culion. According to Mercado,[3] from 1910 to 1912 he gave the treatment to 52 patients, 24 of whom "recovered, blood negative." Apparently most of these relapsed, for only four treated cases were released in 1913, after being negative for two years. These were the first so to be released, though one other recovery had previously occurred, spontaneously, at Culion. Two more treated patients were discharged from San Lazaro in 1915, and 23 from Culion. All of the latter group showed neutral stigmata, suggesting that treatment had been aided by a comparatively high tendency to spontaneous recovery.

The only indication of quantitative results obtained during this period is that of 30 selected cases treated at San Lazaro by a special committee appointed in 1914, six had become negative before the end of two years. We are unable to say how many of these were ultimately released. After 1915 comparatively few patients were held at San Lazaro for continued treatment.

As is the common experience, enthusiasm on the part of the patients tended to wane. In 1915, 1500 received treatment at Culion (apparently weekly). Later reports were to the effect that attendance was declining, and in 1919 an average of only 700 injections were given weekly. No record is available of the total numbers who took treatment, but it was undoubtedly less than half, and at that time perhaps only one-third, of the total population, which was about 4500 in 1919. In 1922 the same number of treatments were being given, with about 5000 in the colony. Though the treatment was at least beneficial to most of those who could take it energetically and persistently, and probably increased the average length of life, most patients were irregular in attendance, for the medicament was often so irritating to the tissues that the treatment was decidedly heroic.

To ascertain the number of cases discharged between 1916 and the present period, various records have been examined, especially those of the official committee on diagnosis, on which one of us served from 1916 to 1922. Absolute accuracy for one or two of the years is not possible, but the figures in Table I. are essentially correct.

Excluding the 29 discharged previous to 1916, the treatment work with the Mercado mixture

* A paper read before the Royal Society of Medicine on Feb. 2nd and published with the consent of the Director of Health, on recommendation of the Philippine Leprosy Research Board.

[1] Annual Report of the Director of Health (V. de Jesus), 1919, Manila, 1920.

[2] Heiser, V. G.: Report of the Director of Health, 1913 (July 1st to Dec. 31st), Manilla, 1914 (?); also U.S. Pub. Health Reports, 1914, xxix., 2763.

[3] Mercado, E.: Proc. 2nd Regional Assembly of Physicians and Pharmacists of the Philippines, 1914, p. 105, Manila; separately published (English trans. by Dr. M. Tolentin of Manila, 1915.

produced 59 discharged cases in six years, an average of 10 a year.

TABLE I.—*Treated Cases Discharged from San Lazaro Hospital, Manila, and the Culion Leper Colony, to 1922 (a).*

	Previous.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	Total.
San Lazaro	4	2	4(c)	14	5	2	2	9	42
Culion (b)		23	4	1	4	0	12	2	46
Total	4	25	8	15	9	2	14	11	88

(*a*) Discharged cases that had become negative at San Lazaro in 1920 (Mercado treatment) and in 1921, and a number of Mercado cases discharged from Culion early in 1922, appear in the figures of Cavino and Tietze (Table II.).

(*b*) One case, spontaneously recovered.

(*c*) Not including five patients eloped after one negative examination.

Present System.

The whole situation has changed since the advent of modern treatment methods, so much so that the general plan of the anti-leprosy campaign in the Philippines has evolved to a three-phase one, in which both treatment and segregation play leading rôles.

Two phases have to do with the handling of segregated cases: (1) Those more hopeful of successful treatment are to be kept for that purpose in regional treatment stations of the hospital or asylum type; this will permit close supervision, will provide the most encouraging milieu possible, and will meet in part the objection to segregation in a distant place. (2) Those proven unfavourable for effective treatment are to be transferred to the Culion Colony where they can lead more normal lives; here those who are suitable will continue to receive such treatment.

The other phase, which it is hoped will be started in 1927, is to be the searching out and dispensary treatment of clinically positive but bacteriologically negative cases. This is the activity on which Muir places so much importance for India. If it can be carried out thoroughly it will undoubtedly greatly hasten the reduction of leprosy, but the practical difficulties are such that it will require workers of unusual enthusiasm and personality to overcome them.

At present the system is in transition. Only at Manila and Cebu are there quarters that can be used as treatment stations even to a limited extent. Such of the favourable cases collected there as can be accommodated are held for continued treatment, the rest being sent to Culion. All cases found in other regions are still sent here direct. Negatives are no longer all held until they can be discharged after the two-year negative period; under certain conditions they may be paroled after six months, to return weekly for treatment and examination. Discharges and paroles are made from Cebu as well as Manila, a second committee for diagnosis having been appointed at the former place.

Present Treatment and Results.

With regard to the preparations now used, it is sufficient to say that the mixed chaulmoogra ethyl esters constitute the chief medicament, for the most part with iodine added to reduce irritation (0·5 per cent. heated until brown). Weekly intramuscular injection is the almost universal rule.

It is not practicable to present the results in such a summary as may be desirable, for more or less continuous treatment work is being done in three places, and patients are being discharged from two, the work in these places not being closely coördinated. It is therefore preferable to deal separately with each centre of activity.

1. *San Lazaro Hospital.*—Here experiments with the newer methods were begun on a small scale in July, 1920, primarily with the sodium salts introduced by Rogers, the ethyl esters being added shortly thereafter. In due course the old treatment was generally abandoned, the ethyl esters being then used almost exclusively. The results obtained here have been summarised by Cavino and Tietze.[4] The pertinent figures, with recent additions, are given in Table II.

TABLE II.—*Numbers of Patients Treated, becoming Negative, &c., at San Lazaro Hospital, Manila, 1921 to 1924 inclusive.**

	1921.	1922.	1923.	1924.	1925.
Total patients treated	443	606	642	650	649
(*a*) Admitted during the year	302	391	339	303	244
(*b*) Previously admitted	141	215	203	347	405
No. treated in previous year, now transferred to Culion, &c.	211	230	401	295	374
Number becoming negative during year	21	32	36	84	183
Number discharged or paroled	—	18	62	35	150

* Adapted from report by Cavino and Tietze. Data from 1925 recently furnished, personal communication. Figures for cases under treatment in 1920 omitted since comparatively few received the newer preparations, and those for only six months.

From this summary it is seen that in five years, 1921–25 inclusive, a total of 250 (average 50 per year) bacteriologically positive cases became negative. During the first four years 115 (including probably 20 to 25 that became negative under the old treatment) had been discharged or paroled. The surprisingly large number released in 1925 (150) these workers ascribe to the fact that maximum results are obtained only after long periods of treatment.

It is to be realised that since San Lazaro Hospital is primarily a collecting station, with insufficient accommodation for retention of all patients eligible to stay there under the plan, much of the population has been shifting. This is to some extent disadvantageous, but on the whole it has probably been otherwise, permitting better selection of cases. The reporters wisely refrain from drawing statistical conclusions from their data. The duration of the disease in these cases is not discussed. However, data as accurate as can be hoped for were got by Callender and Bittermann,[5] who carefully questioned a representative group of 259 patients during this period. The average was 2·65 years (corrected figure).

It is to be pointed out that the above figures cannot fairly be compared directly with those in Table I., for in the earlier period comparatively few patients were held at San Lazaro for continuous treatment. However, it is not without significance that San Lazaro alone releases several times as many per year as Culion and San Lazaro together formerly did.

2. *Cebu Detention Camp.*—This has been less a treatment station than has San Lazaro, as relatively fewer patients could be held for continuous treatment. Nevertheless, a not inconsiderable number of patients have been paroled from here, as is seen from Table III.

TABLE III.—*Data on Treatment Work at Cebu Detention Camp.*†

	1923.	1924.	1925.
Remaining from previous year	24	64	104
Collected during year	265	189(*a*)	165
Total	289	253	269
Transferred to Culion	202	84	152
Died, escaped, &c.	5	15	7
Released (parole)	18	50	8
Remaining (incl. negatives)	64	104	102
Total	289	253	269

† From the (unpublished) Annual Reports of the District Health Officer, Province of Cebu for 1923 and 1924, Dr. S. A. Chiyuto, now Chief, Culion Leper Colony; for 1925, Dr. Agusano.

(*a*) Certain discrepancies in this report make the accuracy of these figures questionable.

[4] Cavino, C., and Tietse, S.: Jour. Phil. Is. Med. Assoc. 1925, v., 50; also personal communication.

[5] Callender, C. R., and Bittermann, T.: Phil. Jour. Sci., 1925, xxvii., 9.

The total figures for admission, &c., are not of importance here except to emphasise the large turnover in this institution. In view of this, the number parolled, totalling 76 in three years, is creditable. It is to be said that the small number parolled in 1925 is probably due to a tendency of patients to abuse the parole privileges by not returning regularly for weekly injections.

3. *Culion Leper Colony.*—New work was started here in the middle of 1921, with 500 cases. Most of them received ethyl esters, but groups of 50 each received sodium gynocardate and sodium morrhuate, and a control 100 the Heiser-Mercado treatment. By the beginning of 1922 1000 cases were under treatment, the ethyl esters being used almost exclusively. Increased appropriations, further augmented because of the keen interest taken in the matter by Governor-General Wood, made it possible greatly to expand the activity, and by the end of that year a total of 4458 cases had been, for a time at least, under treatment. The average duration of the disease in these was about eight years,[6] certainly too long for systematic —i.e., "cutaneous" and "mixed" cases to be considered favourable treatment material.

Since then there has naturally been much change. Many patients have proved, or become, unsuitable for treatment. Death has unavoidably taken its quota. New patients have been brought in (total 1630, 1923 to 1925 inclusive), and all suitable cases have been treated. The exact total involved cannot be stated, but it is less than the total of the total figures given—i.e., somewhat less than 6000.

We will not discuss the results in terms of percentages improved. Important as this is, the final test of effectiveness of treatment is the ability to carry improvement to the point of causing bacteriologically positive cases to become negative, and to remain so. To date (Nov. 1st, 1926) 358 patients have been discharged or parolled, 27 have died while in the negative period, and there are (Nov. 1st, 1926) 244 negatives now undergoing observation, bringing the total to 629. This is about 10·5 per cent. of all cases treated.

When this can be done in a leper colony, where the patients are bacillus-positive, very few early, and many proven unsuitable for treatment, where they live scattered over a wide area, and so not under close control, where many cannot be persuaded to deny themselves the harmful indulgence of marriage or its equivalent, and where they are constantly associated with discouraging, hopeless cases, it must, we feel, be admitted that an important advance has been made in leprosy treatment.

Relapses.

With reference to what actually constitutes a relapse the experience of the first three years work at Culion, investigated by one of us from the viewpoint of the bacteriologist, emphasised the following basic principle:—

The disappearance of bacilli in patients improving under treatment being a gradual process, at some stage it will become a matter of chance whether any of the remaining bacilli will be found in material taken for examination, and thereafter the chance will decrease progressively. Consequently, it is practically unavoidable that some patients be declared negative earlier than they should be, and that at least some of these should suffer interruption of that period because of subsequent positive findings. Such cases in the absence of *definite indication of reactivation of the disease* should not be considered relapses.

These and other considerations emphasise the necessity of repeated careful standard examinations before declaring a patient negative, continued treatment and repeated examinations for a definite period (two years) thereafter, and occasional examinations for several years more.[7]

Of the experience in the earliest period of Philippine work, Heiser stated that no treatment had caused any patients to remain bacteriologically negative for two years previous to the use of the Mercado mixture. Better as this was, an unfortunately large proportion of negatives relapsed, not a few of them permanently. Several so relapsed at the end of the two-year period or after release. Unfortunately, accurate data cannot be worked out from available records.

Culion records showed, in October, 1925, that of the 508 patients who had then been put on the negative list since 1922, 15 per cent. (75) had at some time been removed because again found bacteriologically positive. One-third of these had already been returned negative. In less than half of the instances (ratio 29·35) was any clinical evidence of reactivation recorded. In several instances the interruptions were clearly due to overlooking in the first instance some region that should have been examined bacteriologically; this was before a systematic record card had been introduced.

According to calculations based on the data obtained some 50 of the 246 who had been parolled or discharged up to that time might be expected to be found at least bacteriologically positive. Actually, of the 358 that have now been sent out (November 1926) only four have been sent back to Culion, one out of 115 discharged, three out of 245 parolled. One other is held at San Lazaro. Unfortunately, we cannot stress these figures. It is known that the released cases have not been thoroughly followed up. However, there is, to our minds, no doubt whatever that actual relapse is now relatively much less frequent than in the past.

Discussion.

To compare the totals indicated above, 88 discharged cases (1913 to 1921) with 684 (1922 to 1926), would not be a valid measure of the greater effectiveness of the newer preparations, for treatment work is now much more extensive and intensive than in the past, and the former figure includes only cases discharged after a two-year negative period, "parole" not being granted at that time. However, we have been satisfied, from the results of direct comparative trials both at San Lazaro and at Culion, that the ethyl esters can be employed more effectively than the Mercado mixture. For, while the action of each of these preparations depends on the same active principles, a given dose of the former is much smaller in bulk and less irritating locally than an equivalent dose of the oil-mixture and is more readily absorbed, as shown both by clinical observation and by experimentation.[8]

The present view is that for large-scale work the modern treatment methods are decidedly superior to the older ones, and that they seem to be particularly effective in early cases. Though they are admittedly much less effective in well-established advanced cases, the results obtained in the Philippine Islands during the last few years show that a not inconsiderable proportion of such cases (probably 15 to 20 per cent.) can be "apparently cured" if treated intensively under proper conditions. This is a noteworthy advance, however discouraging to anyone treating any particular small group of unselected cases. In view of the impressive total, which all 1926 releases will bring to 800 or more, one cannot, we submit, deny the relative effectiveness of present treatment, or its absolute value in properly selected cases. It were quite as correct to deny the value of surgery in cancer. In leprosy, as in cancer, emphasis must be laid on getting the patient early. It is from this viewpoint that treatment is now revolutionising anti-leprosy campaign systems.

[6] Wade, H. W.: Trans. Fifth Congress Far East Assoc. Trop. Med., Singapore, 1923, London, 1924, p. 363.

[7] The matter of relapses is discussed more fully in another paper: Wade, H. W., and Lara, C. B., Jour. Phil. Is. Med. Assoc., in press.

[8] Walker, E. L., MacArthur, C. G., and Sweeney, M.A.: Trans. 19th Annual Meeting National Tuber. Assoc., pp. 553–56. Also collected reprints, George Williams Hooper Foundation, 1922–23, vol. vii.

Clinical and Laboratory Notes.

A CASE OF SEVERE CHOREA ASSOCIATED WITH TAPEWORM,

WITH REMARKS ON THE TREATMENT OF THIS DISEASE.

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THE special interest of the following case lies in the fact that the patient was distinctly rheumatic, although the movements ceased almost as soon as the tapeworm was passed.

The patient was a girl aged 9½ years. Both parents were rheumatic. The father had suffered in early life from acute rheumatism, and the mother suffered at times from pains in the shoulders and ankles. An only brother, aged 12, had a severe attack of acute rheumatism at the age of 10, which affected the heart. The patient herself had had frequent attacks of sore-throat, and a year previously had a slight attack of chorea.

When first seen she had been ill for about ten days. She was confined to bed, and her movements were extremely violent, so much so that on two occasions she had fallen on to the floor. Her face was abraded from constant rubbing on the pillows, and one of her elbows was skinned. She jerked her head, arms, and legs continuously so that she could only be restrained with the greatest difficulty. Under the circumstances feeding had become almost impossible. The temperature was 102·6° F., rising to 103° F. towards evening. The pulse was very rapid, feeble, and somewhat irregular. The average rate was between 140 and 150. Respiration was very difficult and irregular. The patient took no notice when spoken to, and looked extremely haggard and pale. Examination of the heart, which was by no means easy, revealed a considerable amount of enlargement and a definite systolic bruit at the apex.

As the bowels had not acted for five days an enema was given, which yielded a good result. After this the girl was given chloral hydrate gr. 10 per rectum, and this dose was repeated in six hours. At the same time salicylate of soda gr. 10 4-hourly was ordered, and she was put between blankets on a water-bed. Next day the temperature fell, but the movements remained quite as severe; and the possibility of tapeworm was accordingly thought of. Some years ago I had published three cases of chorea associated with tapeworm,[1] but since then I had not met another case of the kind. In this case the association existed, and early in the morning she was given half a drachm of ext. filicis liq. in warm milk. Four hours later a dose of magnesium sulphate was administered, and in the forenoon she passed a large tapeworm. Unfortunately the head could not be found.

On the evening of the same day the movements were markedly lessened. The temperature had fallen to 99·4° F., and the child for the first time spoke. She asked for water, and wished to sit up in bed. From then onwards she made an uneventful recovery. She was, however, kept in bed and given salicylate of soda for nearly a month, during which time the condition of the heart gradually righted itself. She was then ordered iron and cod-liver oil.

Had this child been treated by means of arsenic recovery could not have taken place. The case emphasises the importance of determining the exact cause, especially in severe cases of chorea, even in subjects known to be rheumatic. This patient was definitely rheumatic, and yet the chorea was obviously started by the presence of a tapeworm. Chorea seldom occurs in any but rheumatic children, and yet not every rheumatic child suffers from chorea. Before it can develop there must be some exciting cause superadded to the constitutional disease. This exciting cause may be school strain, the approach of puberty, fright, or, as in this case, the presence of intestinal parasites. It is incumbent upon us to discover such exciting factors, and either counteract or remove them before undertaking the treatment of the chorea itself. This is matter too often forgotten or neglected in such cases. The result is that cure is either delayed, or at best is very imperfect.

As regards the treatment of chorea itself, it is extraordinary to find how many still cling to the routine administration of arsenical preparations. It is a guiding principle in therapeutics to treat, if possible, the cause of any disease. In practically every case of chorea occurring in childhood we have a definite underlying constitutional condition—namely, rheumatism. Surely, therefore, it is our duty in all such cases to administer one of the salicylate group of remedies. There are those who maintain that there is no known drug which will actually cure chorea. This is, to a certain extent, perfectly true. At the same time it is incumbent on us in all such cases to give antirheumatic remedies with a view to counteracting the rheumatic influence at work. In this respect, acidum acetylsalicylicum is to be preferred to salicylate of soda, as it is less likely to produce symptoms of acidosis and at the same time is rather more pleasant to take. When salicylate of soda is given, it is always advisable to combine it with an equal quantity of the bicarbonate, and only the pure natural salt should be employed. Another important fact to be kept in mind is that small doses are not likely to do much good. To a child of ten years not less than gr. 10 either of acid. acetylsalicyl. or of salicylate should be administered for a single dose, and this may be repeated thrice daily or every four hours, according to the severity of the attack.

If arsenic is given it should never be pushed, as is far too frequently done. In fact, there can be no doubt that many so-called cases of chorea by means of this drug are due to the production of peripheral neuritis. Like other observers, I have met with several cases of this kind. The usual practice is to begin with drop doses of the liquor arsenicalis, and go on gradually increasing the dose by 1 minim until 10 or even 15 minims are taken three times a day. This, in my opinion, is a very dangerous practice. Not only does the arsenic fail to benefit the rheumatic condition underlying the chorea, but it renders the patient liable to very bad after-effects. In one case a child had been getting 15 minims of the liquor arsenicalis thrice daily for several days. The choreic movements had certainly entirely ceased, but the child's limbs were completely paralysed. There was a mild degree of drop-ankle and drop-wrist present, and on grasping the limbs the patient winced. Sometimes these symptoms do not appear at once. They may be delayed until some time during the convalescent period. In one such case the onset of the neuritis did not occur until three or four weeks after the patient had been allowed out of bed. If, therefore, arsenic is given, it should be administered in moderate doses, and heroic amounts, such as 10 or 15 mimins, should not be approached in any case. If this drug is going to benefit the case, it will certainly do so in doses ranging from 3 to 5 minims; if not, then the sooner its administration is given up the better.

Other drugs which have their advocates are chloral hydrate, which appears to act best in those cases in which the sleep function is disturbed. It is certainly to be preferred to bromides in such cases. Sometimes, especially in younger children, phenazonum may be tried, as it certainly seems to possess a sedative and antispasmodic action; but its effects must be carefully watched. The only other drug which need be mentioned is calomel. This is of special value, I find, in cases where the heart is seriously involved.

There are certain other points in the treatment of chorea which have to be kept in view. I believe that such cases should always be treated between blankets. Watch should be kept on the skin lest bedsores develop, and every care taken to prevent their occurrence. Sometimes a water-bed will be necessary. In the diet, soups, eggs, custards, farinaceous foods, porridge, fish, chicken, jellies, and fruit are all of value. Tea with an equal amount of milk may be given. Rusks, toast, bread with butter, dripping, or marmalade may be allowed. Care must always be taken to see that the patient's food is

[1] British Journal of Children's Diseases, March, 1905.

sufficient, digestible, and given at regular intervals. The best liquids are plain or soda or Vichy water.

A daily evacuation of the bowels should be secured, and, needless to say, regular bathing of the skin must not be neglected. The heart must be examined at every visit, not only by auscultation, but also by light percussion, by means of which evidence of dilatation will usually be detected, long before a murmur can be heard. It is strange that percussion of the heart in children is so little practised, and yet it is of fundamental importance in such cases.

How long must the patient be in bed? Very often six weeks is not too long a period. Much depends on the severity of the case and on the amount of involvement of the heart. This being so, we must, to some extent, compensate for the enforced want of real activity by making use of massage. Massage in such cases not only keeps up the nutrition of the limbs, but actually aids in checking the choreic movements if regularly and properly carried out. To be of value it should be gentle, and stroking rather than kneading movements should be employed by the operator. The child will often sleep better if the massage is carried out in the evening; and, in any case, it should be done twice a day, if possible.

During convalescence attention should be devoted to the heart. It is always well to give gr. 5 of one of the salicylate group along with gr. 5 or 10 of the saccharated carbonate of iron for several weeks thrice daily. Nux vomica and cod-liver oil are also of great value in restoring nutrition. Return to school should be delayed for at least three, and preferably for six, months. Watch must be kept throughout for any signs of pains in the limbs or joints, for sore-throat, or, indeed, for any other possible rheumatic manifestation. The patient should have the heart examined by the medical attendant at least once in six months as long as may be considered necessary. I have met with many cases of heart affection in adults traceable to chorea in childhood where no after-care had been taken. Is it too much to state that not a few of these cases might have escaped any serious heart involvement if greater attention had been paid to them during the convalescent period and in the years thereafter?

A CASE OF
PETECHIAL HÆMORRHAGES
ON THE LUNGS AND HEART OF AN UNBORN CHILD.

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THE following case is worthy of record.

A young woman, eight to eight and a half months pregnant, received a blow on the head from a heavy stick and died shortly after. She was examined at the medico-legal mortuary on the following day, and the fœtus was removed from the uterus. On examination of the thoracic organs of the child numerous petechial hæmorrhages were observed on the anterior surface of the heart and aorta and over the right and left lungs. They were scattered over the whole surface of the lung, but were more intense on the surfaces in contact with heart and on the interlobar surfaces. The hæmorrhages varied in size from small pin-pricks to spots the size of a pin's head. The surface of the left lung had a slightly mottled appearance in the upper lobe, but as a whole the lungs looked as though they had never respired. They sank when placed in water. On microscopic section no trace of vesicles could be observed, but under the pleura and scattered throughout the whole of the lung tissue there were numerous hæmorrhages. These were by no means petechial but took up quite a large part of the section. Numbers of greatly dilated capillaries could be observed and these were in many cases surrounded by blood. In certain places hæmorrhages could be traced from the lung tissue to the pleura. There was no sign of organisation of the blood or other change in the tissues of the lung.

The other organs of the child and the organs of the mother were healthy.

The case has some medico-legal interest, for the appearance of the lungs was exactly similar to the condition found after asphyxia by violence. The origin of the hæmorrhages is not easily explained. It is obvious that rupture of capillaries must be the result either of excessive blood pressure or of damage to the vascular walls or both. In this case damage to the capillaries is not likely to have occurred as the death of the mother took place within a few minutes, and she was previously in normal state of health. Increase of blood pressure must therefore be the principal causal factor, and it is of interest to ascertain in what manner this might produce the conditions found.

When the mother died the fœtal blood circulating in the placenta would be deprived of its oxygen and remain charged with the products of metabolism. If vasomotor control in the fœtus is operative, this would cause an increase in blood pressure, and I suggest that this case gives some justification for the assumption that the centre is operative in the fœtus.

In the fœtal circulation, it will be remembered, oxygenated blood from the placenta passes by the inferior vena cava to the right auricle, and is directed across this chamber and passes through the foramen ovale into the left auricle. Impure blood from the upper part of the body passes by the superior vena cava into the right auricle, and after mixing slightly with the blood from the inferior vena cava, passes to the right ventricle through the tricuspid valve. This impure blood then passes to the pulmonary artery, and after a small quantity is distributed to the lungs by the right and left branches, the main bulk of the blood enters the aorta by means of the ductus arteriosis. The normal blood pressure in the pulmonary artery and right side of the heart must be greater than the pressure in the aorta and left ventricle, otherwise it would not be possible for the blood in the pulmonary artery to be forced into the aorta.

If, now, anything occurs which stimulates the vasomotor centre, the increase of pressure will occur only in the systemic circulation, for the pulmonary circulation is not controlled by this centre. A point may thus be reached where the pressure in the aorta is equal to the pressure in the pulmonary artery, and the full quantity of blood in the latter, instead of finding an outlet into the aorta through the ductus arteriosis, must be forced through the lung capillaries. This increase in volume of blood would naturally cause dilatation of the capillaries, and numerous hæmorrhages by rupture would result. The condition found microscopically would thus be reproduced.

TWO CASES OF
STREPTOCOCCAL EMPYEMA TREATED BY CONTINUOUS ASPIRATION.

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THE treatment of empyema by continuous aspiration appears to have attracted comparatively little notice in recent discussions on the subject; hence the following two cases treated by this method are worthy of record, especially as both were streptococcal in origin. The technique used was fully described by F. J. Poynton and F. N. Reynolds.[1] Briefly it consists in introducing a short silver cannula between the ribs by means of a trocar, novocaine anæsthesia being used. A tight-fitting rubber catheter is then passed through the cannula, and suction is applied by means of a water pump. The only modification of the original method was the use of an elastic rubber belt to keep the cannula in place, and this was found far more effective than tapes.

The two following cases were admitted on successive days to the Hospital for Sick Children, under the care of Dr. F. J. Poynton.

CASE 1.—A boy aged 6 years and 2 months. The history began with broncho-pneumonia on Dec. 27th, 1925, the

[1] THE LANCET, 1921, ii., 1100.

patient getting steadily worse until Jan. 7th, 1926, when a swelling appeared on the right side of the chest. On the following day the chest was aspirated and 3½ pints of pus removed. On Jan. 11th a similar amount was withdrawn, and on the following day a rib was resected. Very little fluid was found in the chest, and only a negligible amount drained from the wound. The condition getting worse, the patient was admitted to hospital on Jan. 21st.

On admission he was very pale and emaciated, obviously in a serious condition, and with a temperature of 102·8° F. Examination of the chest suggested a pyopneumothorax under considerable pressure, both respiratory distress and displacement of the heart being very marked. The operation wound was very low down, and drainage could not be established through it. The chest was aspirated and several ounces of pus removed. The condition at once improved and the temperature fell, but subsequently rose again, and on Jan. 31st a further 8 ounces of pus were removed. Again a temporary improvement occurred, but the temperature rising once more, it was decided to start continuous aspiration. This was done on Feb. 5th. Pus drained away freely for the first few days, and then rapidly diminished. The cannula was removed on Feb. 16th and recovery was uninterrupted.

A hæmolytic streptococcus was isolated from the pus.

CASE 2.—A boy aged 9 years and 1 month. The illness began 12 days before admission, with pain in the right side of the chest. On admission the boy was in a very toxic condition with a temperature of 102·4° F. A needle was inserted and 3 ounces of very foul-smelling streptococcal pus removed. A small abscess containing similar pus subsequently formed at the site of the puncture. The temperature fell after the aspiration but rose again, and on Jan. 29th continuous aspiration was instituted. Two days later the wound round the cannula became infected, probably as the result of an error of judgment in the introduction of the cannula too near to the original puncture, and the cannula had to be removed. Fomentations were applied to the chest, and the wound infection rapidly cleared up.

On Feb. 8th a self-retaining catheter was introduced through the original puncture in order to maintain drainage; it was removed on Feb. 12th as all discharge had ceased. The temperature now remained normal for over a week, but on Feb. 20th it began to rise again. On Feb. 24th continuous aspiration was again resorted to, the cannula being replaced under nitrous oxide anæsthesia. Some ounces of the same foul-smelling pus drained away. For the next dew days pus continued to discharge and then gradually ceased. The cannula was removed on March 10th, and thereafter recovery was uneventful.

Discussion.

In both these cases a surgical opinion was obtained, and in each case, though aspiration was regarded as a mere preliminary to operation, surgical interference was subsequently found to be unnecessary. Two points, on account of their practical bearing on treatment, appear worthy of further emphasis.

The first of these is the failure of simple aspiration and the success of the method of continuous drainage by aspiration, which by itself suggests that this should be adopted by choice. It is well known that simple aspiration is sufficient to bring about an ultimate cure in many cases of empyema, but even so it is certain that a considerable quantity of pus must be left in the pleural cavity to undergo absorption or organisation with resulting toxæmia, and the possibility of permanent impairment of the lung. These disadvantages are avoided by the method of continuous aspiration, and it is interesting to note that in the cases under discussion the completeness of the recovery was confirmed by both clinical and radiological evidence.

The second point is that both these cases were examples of a streptococcal infection, in which it is a matter of general agreement that open operation is essential. In fact, the usual objection to all aspiration methods is that the streptococcal infections do not clear up, while in the pneumococcal types large fibrinous masses tend to be left behind, which interfere with the subsequent expansion of the lung. The former objection was shown to be groundless with treatment by continuous drainage; the latter lies, perhaps, beyond the scope of this note, but there is reason for believing that such fibrinous masses undergo liquefaction and are efficiently dealt with by the same method.

Lastly, the simplicity and almost painless nature of the manipulations must be emphasised. Both the above patients were highly strung, nervous boys, but in neither case was any difficulty experienced in introducing the cannula, and once in position it was quite painless. In addition to this, the daily dressings, so often a source of terror to children, are completely done away with.

It will take time and a more extended experience before the final results by this method can be critically compared with those of open operation, but its essential superiority to any method of intermittent aspiration appears to be beyond doubt.

My best thanks are due to Dr. Poynton for his permission to publish these cases.

Medical Societies.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Sheffield on Feb. 25th, Prof. FLETCHER SHAW, the President, in the chair. Prof. D. DOUGAL read a paper on

A Hundred Cases of Ectopic Pregnancy

operated on by him during the last seven and a half years. The number of operations actually performed was 105, as in five instances a second operation for a similar condition was carried out. The main features of the cases were as follows.

Pathological Anatomy.—The pregnancy was situated in the Fallopian tube in 103 cases. In two cases of infected hæmatocele only the posterior fornix was opened. In the vast majority pregnancy was early; in only two cases had the fœtus reached two months development. In 76·5 per cent. of cases tubal mole was present, whilst there was no mole in the remainder. The pregnancy was on the right side in 59 per cent. and on the left side in 41 per cent. The terminations observed at the time of operation were as follows: tubal abortion, 52 per cent.; tubal rupture, 37 per cent.; unruptured, 12 per cent. In four cases it was impossible to give an opinion. Both rupture and abortion were noted in one case.

Ætiological Factors.—Sixty-six per cent. of cases occurred between ages of 26 and 35; the youngest patient was 21 and the oldest 43. The greatest number of cases occurred during the first five years of married life, a considerable proportion during the second five years. In eight cases the patients had been married one year or less, and in all of these the ectopic was the first pregnancy. Evidence of pelvic infection was noted in only one of these cases.

Nearly one-third of the patients had never had a previous uterine pregnancy. In those who had previously been pregnant—given that the normal interval between successive pregnancies was not more than three years—the interval was unduly long in 55 per cent., and it exceeded five years in 31 per cent. The shortest interval was seven months.

The chief predisposing cause of extra-uterine pregnancy, said Prof. Dougal, was undoubtedly a previous pelvic infection which had so damaged the Fallopian tubes as to obstruct or delay the passage of the fertilised ovum to the uterine cavity. Developmental abnormalities and distortion of the tubes might have a similar result, but occurred less often. In certain cases—e.g., gonococcal—evidence of old infection could only be obtained by microscopical examination of the tubal mucosa. In this series old-standing adhesions had been present in 50 per cent. of the cases. The opposite tube was converted into a hydrosalpinx in seven cases and a pyosalpinx in one case. The only developmental abnormality met with in this series was a bicornuate uterus; this pregnancy was situated in the right tube, and terminated by abortion. Fibroids were seen in two cases.

Symptoms and Clinical Types.—Diagnosis rested on a symptom-complex which included one or more of three cardinal symptoms — amenorrhœa, irregular uterine hæmorrhage, and abdominal pain. Pain on defæcation was also an important symptom. Shoulder pain was usually associated with ruptured tubes where the peritoneal cavity was suddenly flooded with blood. The incidence of the symptoms was as follows: amenorrhœa, 72 per cent.; irregular uterine hæmorrhage, 92 per cent.; abdominal pain, 97 per cent. Irregular uterine hæmorrhage was associated with separation of uterine decidua, but might persist after complete expulsion of decidua or after curettage, in which case it might be due to presence of living chorionic villi. Abdominal pain was generally sufficient to indicate to the patient that something was wrong; it might be lancinating, colicky, or diffuse. The site of the pain generally indicated the site of the pregnancy. Amenorrhœa, uterine hæmorrhage, and abdominal pain were present together in 64 per cent. of cases, whilst bleeding and abdominal pain were associated in 24 per cent. Amenorrhœa and abdominal pain were found in about 4 per cent., amenorrhœa and bleeding in 3 per cent., and pain alone in 3 per cent. The cases might be divided into three groups or clinical types: (1) Those in which the ovum remained in the tube, and there had been little or no hæmorrhage into the abdomen (13 per cent. in this series). (2) Those in which rupture or abortion had recurred with diffuse intraperitoneal hæmorrhage (27 per cent.). (3) Those in which rupture or abortion had taken place with gradual or repeated hæmorrhage into the abdomen (60 per cent.).

Treatment was surgical, and the sooner the better. It was impossible to foretell when another, and possibly fatal, hæmorrhage would occur. In the very severe cases, where the patient was pulseless and profoundly shocked, operation might be delayed for a time while treatment was directed to the shock. When and if the condition of shock was relieved, operation should be undertaken immediately.

Prognosis and After-history.—Prognosis was good, and was better the earlier the operation could be performed. There was no disease of parallel severity in which the response to prompt surgical treatment was so rapid and so satisfactory. There were no deaths in Prof. Dougal's series. As regards subsequent pregnancies, it was found that among patients who could be traced and who had been operated on more than six months previously the results were as follows: subsequent uterine pregnancies, 46 per cent.; subsequent ectopic pregnancies, 13 per cent.; no subsequent pregnancy, 41 per cent. The prognosis for subsequent uterine pregnancy was fairly good, but there was a serious risk of the patient having a second ectopic pregnancy. In this series seven patients had had two ectopic pregnancies.

Discussion.

Dr. F. H. LACEY asked if there was any history of infections in the puerperium. He considered that shoulder pain was usually complained of in ectopic pregnancy.

Dr. W. W. KING considered that rectal pain was more common than shoulder pain. He strongly advised waiting in the very severe cases till the accompanying shock had been treated. He did not regard the other cases as urgent at all.

Dr. LEITH MURRAY had recently examined his series of 112 cases. He had found the pregnancies more common on the right side (67) than on the left (45). He did not agree with Prof. Dougal as to the terminations. In his series the intratubal ruptures greatly exceeded the tubal ruptures. The figures were: intratubal rupture including mole abortion, 105; primary peritoneal rupture, 1; secondary peritoneal rupture, 4; intraligamentary rupture, 2. He agreed that in the majority of cases there was evidence of pelvic disease or a history of antecedent infection. Disease of the appendix might be a common predisposing factor accounting in the first place for the preponderance of cases of pregnancy on the right side. In these cases he had removed numbers of apparently normal appendices, and microscopically had found them diseased. In his series a history of amenorrhœa was less often elicited, and pain was not so marked a feature.

Dr. E. O. CROFT said that in his experience amenorrhœa was not so marked a symptom, and pain was generally abdominal. In some cases it was situated elsewhere than over the lesion.

Dr. A. A. GEMMELL asked if there was any evidence of an increased number of abortions antedating these ectopic pregnancies, as in Germany it had been thought that ectopic pregnancies had increased with the increase in criminal abortion during the war.

Mr. ST. GEORGE WILSON asked if in any of the severe cases transfusion with the patient's own blood had been carried out. He had lately done this in a case of uterine rupture, with satisfactory results.

Mr. W. GOUGH agreed about the need for early operation.

Prof. MILES PHILLIPS had recently collected 150 cases with three deaths. As regards the ætiology, he was of the opinion that in a number of cases ovarian disease or dysfunction was a factor.

The PRESIDENT remarked on the preponderance of ruptures over tubal abortions, and agreed with Dr. Murray that in his experience it was the reverse. He had operated on cases with normal tubes but cystic ovaries, and he considered that ovarian disease was a factor in the ætiology.

In reply, Prof. DOUGAL said that he had no complete details of previous puerperal infection, but he had details of cases with previous abortions. He did not approve of delay in operation in any type of case. The symptoms in unruptured cases were quite definite. He agreed about the large number of cases of ectopic pregnancy on the right side, and he had operated on patients from whom the appendix had been removed previously. In some cases it was difficult to decide whether there was rupture of a tube or an abortion. He had not tried transfusing the patient with her own blood. The ovaries, he thought, might sometimes be at fault.

Fibroids after the Menopause.

Dr. MURRAY, after describing a case of intraligamentary fibromyoma removed from a woman of 60, said that in his experience fibroids rarely caused symptoms in the menopause. In 540 consecutive operations for fibroids only 14 (2·6 per cent.) had caused symptoms in the menopause. Œdema of the fibroid was the usual cause of postmenopausal symptoms.

The PRESIDENT remarked on the small number of postmenopausal fibroids in Dr. Murray's series. He had seen many cases of fibroids which had caused symptoms after the menopause.

Prof. PHILLIPS and Dr. CROFT agreed with the President.

Mr. GOUGH remembered seeing a case of fibroids in the menopause giving rise to symptoms owing to shrinkage. It had previously rested in the abdomen, and when it shrank had fallen down into the pelvis and caused retention of urine.

Dr. MURRAY also described a case of

Congenital Absence of Vagina and Cervix.

A girl, aged 15, was sent to hospital with a history of abdominal pain lasting two years. The pain was colicky, occurred every four to five weeks and lasted, on each occasion, about five days. She had a feeling of much weight in the pelvis at those times and frequently vomited. There had been no menstruation. Examination under anæsthetic on Dec. 16th, 1925, showed a vulval depression which just admitted the top of the index-finger. This was all that could be found to represent a vagina. The vulva and the site of the urethral orifice were normal, and the breasts and pubic hair were well developed. On bimanual rectal examination no thickening such as would suggest a vagina could be found. The uterus appeared to be normal in size and position; the right ovary was readily palpated.

At a perineal exploratory operation the pelvic connective tissue between the urethra and the bladder in front and the bowel behind was easily opened by a finger, after incision

at the apex of the vulval depression. The lower pole of the uterus could just be reached, but was not brought down by volsellum lest injury to the bladder or bowel resulted. No suggestion of any vagina was found.

The girl was kept in hospital for observation during her next periodic pain. There was no question that she began to suffer severely on Dec. 21st. The attack was an obvious colic associated with abdominal pain, tenderness, and backache; it lasted four days and the patient was then very languid and tired. On Jan. 2nd, 1926, the uterus was removed together with the left appendage. The fundus of the uterus was adherent to the bladder, and there was a small quantity of black uncoagulated blood in the pelvis. Both appendages were lightly adherent, particularly around the tubal ostia. It seemed likely that blood had on occasions been regurgitating into the peritoneum. Each ovary appeared normal and neither was enlarged; the uterine body was firm and not appreciably abnormal. On cutting across the broad ligaments, as soon as the uterine arteries had been divided, the uterus was completely released by finger pressure. The lower pole bore no resemblance to a cervix and was uncovered by epithelium. The sudden release of the uterus, after section of the broad ligaments, was very noticeable and quite unexpected; this may have been due, in some degree, to the preliminary exploration.

The length of the uterus was two and a half inches. On opening the cavity about 18 drops of dark fluid escaped; this was obviously under tension. The cavity thereafter was found to measure one and a quarter inches; it ended blindly, and the obdurating bridge at its lower pole measured three-eighths of an inch. There was no evidence of dilatation of the Fallopian tubes.

Sections show no sign of cervical stroma or endocervix. The endometrium is practically normal throughout except at the lowest level, where a slight tendency towards polypoidal development is evident. The wall of the uterus and the obdurating bridge appear as a normal myometrium.

Dr. MURRAY said that he had failed to find in literature any case exactly comparable to this. According to Keibel and Mall,[1] the tubal position of the uterus formed the corpus uteri and the utero-vaginal canal the cervix and vagina; the development of these two was therefore to some extent independent. It seemed remarkable, however, that the demarcation between the distal three-quarters and the remaining quarter of the whole uterine and vaginal tube should be so complete as was evident in this case. Mr. Stacy had read an almost similar case to the Anatomical Society in 1924.

Prof. DOUGAL read notes of a case of

Adhesive Vulvitis.

The patient was 36 years of age, married ten and a half years, and a nullipara. Menstruation was normal. Eight years previously, during a severe attack of pneumonia, she began to complain of irritation about the vulva, and the "vagina healed up." Intercourse had not been possible since, and recently she had had difficulty in micturition. Six years ago she had been curetted, and the adherent labial folds separated, but she had been no better.

On examination the labia minora were found completely glued together in the midline, except at a point about the middle of the vulva, where a small opening one-eighth of an inch in diameter served for escape of menstrual blood and urine. Under an anæsthetic it was found possible to separate the adherent folds without difficulty, and during separation a thin layer of desquamated epithelium was partially torn away and remained stretched across the vulval opening. The area affected consisted of the inner surfaces of the labia minora and the folds about the clitoris. The surfaces were disinfected and separated by a dressing, but in a few days became adherent again, so the vulva was excised, and the vagina orifice well opened up, and no labial surfaces were left in contact. Seen two months afterwards, she was quite well, and there was no recurrence.

Sections of the skin showed inflammatory changes in the deeper layers, and thickening and keratinisation of the squamous-celled layers.

Prof. PHILLIPS asked if Prof. Dougal thought that the infective agent was the pneumococcus. He himself had seen a case of pneumococcal endometritis in pneumonia.

Prof. DOUGAL said that he believed that the condition was due to the pneumococcus.

Dr. LACEY described a case of

Foreign Body in the Pregnant Uterus.

The patient, aged 28, had had amenorrhœa for two months, had felt a lump in the vagina, and had tried to push it back with a crochet hook, which disappeared. She aborted in hospital and at operation the crochet hook was found protruding through the posterior wall of the uterus and firmly embedded against the sacrum. It was removed with little difficulty, and she made an uninterrupted recovery.

The PRESIDENT inquired whether these cases should be reported to the police.

Dr. MURRAY said that he had had a case of premature twins in which he suspected criminal abortion. He had asked the British Medical Association what should be done and had been advised not to do anything unless the patient died.

Dr. J. W. BRIDE had removed two crochet hooks from the abdomen, one from the right kidney pouch and the other from the pouch of Douglas. In neither case was the patient pregnant, though pregnancy was suspected. One of the cases was already in the hands of the police, and when he informed them that the patient was not pregnant, they took no further action.

Dr. CROFT had had a similar case, and had removed the foreign body after the abortion.

Miss RUTH NICHOLSON described a case of cystic papillary tumours of the ovaries.

[1] Keibel and Mall: Manual of Human Embryology. 1912, vol. ii., p. 932.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.

AT a recent meeting of this Society, Dr. J. C. BUCKLEY, the President, in the chair, Dr. J. STANLEY WHITE read a paper entitled

Some Recent Aspects of Gland Therapy.

After dealing generally with the subject of hormone balance he went on to speak of the glands individually. He laid emphasis upon the value of determining the basal metabolic rate in cases of thyroid dysfunction, and speaking of the use of thyroid in obesity reminded his audience that obesity was not necessarily due to hypothyroidism. Obesity was often influenced by gland therapy, but it was obvious that thyroid obesity was really a minor manifestation of myxœdema. Other endocrinological aspects of obesity had to be considered—pituitary obesity, thymic obesity, and gonadal obesity. Referring to the less severe cases of hypothyroidism, he expressed the opinion that these cases were much more frequent than was generally realised. A medical officer of health had stated that sometimes as many as 10 and 12 per cent. of children in a community might be exhibiting mild forms of hypothyroidism. He instanced the type of patient that became readily fatigued and was not able to apply himself closely to study. Such cases responded well to minute doses of thyroid.

Going on to speak of exophthalmic goitre Dr. White said that until recently Graves's disease had been regarded as a condition of hyperthyroidism, the symptoms being attributed to the presence in the blood of a secretion that was normal in quality but abnormal in quantity. The distinction between the excessive secretion of a normal substance and the secretion of an abnormal and toxic substance had only been clearly worked out within the past few years, and we were now compelled to recognise hyperthyroidism as a condition entirely distinct from exophthalmic goitre, and one that called for quite different treatment.

The parathyroid glands, said Dr. White, were embryologically related to the thymus rather than to the thyroid, although in practice it was found difficult to present a parathyroid product which was entirely free from this latter gland. He explained the theories underlying parathyroid therapy, making reference to the Noel Paton school, which regarded the parathyroid as a detoxicating agent in that it seemed to be capable of neutralising the poisonous purin derivative guanidin, which otherwise tended to collect in the muscles. Many clinicians, however, favoured the view that the function of the parathyroid was chiefly to control the

calcium mechanism of the body. In making parathyroid products it was generally the external parathyroid which was utilised.

Dealing with the suprarenals Dr. White cited one case of severe asthma where the patient had received at least 50,000 injections of adrenalin solution. His blood pressure to-day was probably not more than 120 systolic, so that the continued use of adrenalin had not resulted in permanent high blood pressure. In fact, most of these asthmatic cases had a low blood pressure with an exaggerated vagal tone. Reference was made to the classification of hypopituitarism into pre-adolescent and post-adolescent types, and the more modern classification into deficiency of the anterior as opposed to the posterior lobe. Pre-adolescent hypopituitarism involving only the anterior lobe was now referred to as of the Lorain-Levi type. In this type of case the patient was of short stature, the genitalia remained infantile in development, and secondary sexual characteristics were absent. With the well-known type of adipose genital dystrophy (Fröhlich's syndrome) there was, in addition, girdle obesity in which the deposit of fat extended over the lower part of the abdomen to the lower third of the thigh. Speaking of anterior pituitary, the lecturer reminded his audience that Gardiner-Hill claimed to have had better results in cases of defective growth in children by the combined administration of thyroid and anterior pituitary than with either of these glands alone.

After speaking briefly of the recent work of Allen and Doisy in isolating the active extract from the ovary, Dr. White concluded by saying that the uses of gland therapy were many and logical, but we were not likely to advance very far if we took a pessimistic view, or if, on the other hand, we adopted the equally unfortunate attitude of the optimist who was prepared to prescribe gland preparations for conditions which obviously did not lend themselves to it.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this Institution was held on Feb. 17th, when Dr. HENRY COHEN read a paper on the

Diagnosis and Localisation of Spinal Tumours

based on 16 cases. He discussed the diagnosis under three headings: (1) the gradually increasing compression of the spinal nerves and cord; (2) the site of the compression; and (3) the nature of the compression. After a general survey of the clinical features, Dr. Cohen gave a critical account of the available methods of diagnosis. He dismissed the air replacement method of myelography as of no practical value, and then spoke of his experiences with heavy lipiodol introduced by the cisternal route. This procedure, he said, was not without danger because of the irritation and comparative non-absorbability of the drug; he had found it present more than two years after it had been injected. Lipiodol should *not* be used, he thought, (*a*) until a definite diagnosis of compression of the cord had been made by careful examination of signs, symptoms, and cerebro-spinal fluid; (*b*) unless exact localisation by clinical methods was impossible; and (*c*) unless an operation was to be subsequently undertaken. Dr. Cohen showed lantern slides illustrating the possibility of differentiating extramedullary growths by the use of lipiodol. The value of light lipiodol (ascendant) was questionable. After discussing the nature, pathology, and differential diagnosis of spinal tumours, Dr. Cohen indicated the general prognosis with regard to operative mortality, and the likelihood of recovery of function after complete removal of the tumour. He pleaded for the earlier recognition of these cases in order to improve the results in a disease which, when treated early, was one of surgery's greatest triumphs, but if left too late resulted in the tragedy of a bed-ridden paraplegic.

Dr. S. BARTON HALL read a paper on Blood Pressure in the Psychoneuroses, which will appear in a later issue of THE LANCET.

Reviews and Notices of Books.

ALCOHOL AND LONGEVITY.

By RAYMOND PEARL, Institute of Biological Research, The Johns Hopkins University. London and New York: Alfred A. Knopf. 1926. Pp. 273. 15*s*.

IN this book Dr. Pearl has collected together his well-known researches on the effect of alcohol on the duration of life; the main results have already appeared in short papers. That excessive drinking tends to shorten life is not in dispute, but the question remains whether regular moderate drinking, such as "a daily pint or two of beer, or a daily bottle of claret, or a few glasses of whisky and soda" does, in fact, tend to an appreciable decrease in the expectation of life. Dr. Pearl offers some direct evidence on this point in the form of a sample of over 5000 of the working-class population of Baltimore and Maryland. By reclassification he has met the criticism that in his original studies moderate and heavy drinkers had been classed together. The material used was collected (originally for another purpose) by direct inquiry among the families concerned. As regards qualitative classification the limitations of the material available, however tactfully the latter may be sought, and however willingly given, are obvious, but the careful avoidance of bias in obtaining the data and the critical analysis of the results seem to justify the conclusion that in this sample moderate drinking did not shorten life. The heavier drinkers, on the other hand, showed heavier ratio of mortality than either the abstainers or moderate drinkers—a result in accordance with much previous life insurance experience. To draw from these data the general conclusion that the moderate consumption of alcohol has no harmful biological effects would be to press them farther than they will go, and the author is careful to do no more than to suggest that in his opinion this conclusion is probably true. Pearl supplements this statistical evidence with a summary of the experimental work done by himself and others on the effect of alcohol on animals, birds, and insects. From this he concludes that in these cases the racial effect of alcohol is preponderantly either beneficial or at least not harmful, and that this beneficial effect appears to be the result primarily of the fact that alcohol acts as a definite but not too drastic selective agent both upon germ-cells and developing embryos. The chief harmful racial effects were the production of defective offspring in early generations in guinea-pigs and some reduction in fertility. The summing up is perhaps too definite in face of the fact that in C. R. Stockard's experiments with guinea-pigs the beneficial effect did not appear till the fourth generation, the last four generations being unalcoholised.

The book is clearly the result of a large amount of careful work, and the statistical data of moderate drinkers appears to be the first of their kind. Some minor points here and there suggest hasty writing. The statement, for instance, on p. 105 that in these life-tables—"a person goes out of the exposed to risk only because of death" is not accurate, as all the living go out of the exposed to risk at their age at the time of record. The argument on p. 107 that to start the tables at age 20 (and so include among the abstainers persons who died early, but might otherwise have passed from the abstainer class to one of the drinking classes) would be to make the death-rates of the abstainers "spuriously high," is unsound so far as concerns the actual effects of drinking or not drinking, and is only valid as regards the effects of the other habits and characteristics of drinkers or persons liable at some future time to become drinkers—which is not the point under examination. The side issue of the mortality of parents is also not very clearly treated; two points arise which should be dealt with separately. One is the entirely "spurious"

advantage in mortality in a life-table of parents only, due to the inclusion in the exposed to risk of people before the age at which they became parents—i.e., before the age at which death can occur; the second is the selective factor involved in marriage, which again Dr. Pearl does not distinguish from parenthood. The genealogical material used as illustration suggests that it may consist of socially "better" lives than the general population, which would to some extent outweigh the declining death-rate. To go back to the main subject of the book, we may hope that not many people will take seriously Dr. Pearl's advice to "learn by precise experimentation what constitutes moderate drinking *for him*." Precise experimentation with one's own individual expectation of life is apt to be dangerous.

The book contains a bibliography of some 270 works—a selection from a much larger one which the author hopes to publish later.

POPULATION PROBLEMS OF THE AGE OF MALTHUS.

By G. TALBOT GRIFFITHS, B.A. Cambridge University Press. 1926. Pp. 276. 12*s.* 6*d.*

THIS book is a critical and scholarly study of the factors affecting the birth-, marriage- and death-rates prevailing in England and Ireland at the time of Malthus—that is to say, between the years 1766 and 1834. The problems arising from the vital statistics of to-day are not considered, neither does the author draw any inferences bearing upon them from the period he discusses. But in spite of this, the book has much more than an academic interest. The cultural changes which took place between 1750 and 1850 were responsible for the initiation of that upward leap in the population of these islands which, though steadying itself in the latter years of the nineteenth century and in the present century, has since been maintained, and despite the fall in the birth-rate, is still in operation to-day. This fall in the birth-rate. and the behaviour of the birth-rates of other European countries, have in recent years directed much attention to problems of population, which cannot be understood without the historical background which it is the aim of this book to provide. For the task which has here been so painstakingly accomplished, Mr. Griffiths will earn the gratitude of the historian, both of economics and medicine.

Our knowledge of the dimensions of the population of Great Britain and Ireland throughout the eighteenth century is, and is likely to remain, incomplete. But so far as it goes, it points to a fairly uniform increase in the birth-rate from the figure of 27·5 per 1000 in 1710 to that of 35·4 per 1000 in 1790, after which the rate steadily fell to about 32 per 1000 in 1836, the year of Malthus's death. Far more dramatic than anything in the birth-rate, however, are the changes presented by the death-rate during these years. The curve of the death-rate seems to have reached a peak of 33·4 per 1000 in the year 1730, when it was actually higher than the birth-rate; and then, except for a rise of 2 per 1000 between 1760 and 1780, to have plunged downwards till the year 1810, when, in the figure of 19·9 per 1000, it reached its lowest point for the indicated period. Between 1730 and 1810—a period of 80 years—the birth-rate maintained itself within a margin of 2 per 1000. Between 1780 and 1810—a period of 30 years—the death-rate fell by 9 per 1000. The chief argument of this book is based upon a comparison of these rates, and is to the effect that, discounting immigration from Ireland, the sensational fall in the death-rate during Malthus's life was a more important factor in the increase of the population than was the comparatively small change in the birth-rate. The prominence to-day given to the subject of artificial birth control in public discussion—a practice first popularised during this period not by Malthus (the author thinks that Malthus would have been opposed to it) but by Francis Place—has resulted in stress being laid on the birth- rather than the death-rate in causing the increase in population that characterised the period. The facts adduced by Mr. Griffiths seem to indicate that the stress has been laid upon the less important phenomenon.

The various factors affecting the birth-rate by encouraging early marriages and fecundity in marriage—factors chiefly social and economic—are closely examined. To medical men, however, the factors recognisable for reducing the death-rate will be of greater interest. A chapter of some 50 pages is devoted to an analysis of the influence of increase in medical skill upon the fall in the death-rate. Though medical skill can increase the birth-rate by eliminating factors like venereal disease and lead poisoning which diminish the number of births, it is upon reducing the death-rate that it exerts its most important effect. During the period here reviewed medical teaching was organised all over Europe, and the foundations of our existing hospital and dispensary systems were laid. Through improvements in sanitation and through the realisation—first occurring at this time—of the importance of cleanliness and ventilation, the incidence of fevers was much reduced. In the earlier years of the eighteenth century fevers were responsible for one fifth of the annual mortality of London. Deaths from puerperal sepsis were also much diminished through the same agencies. But from the social point of view, perhaps, the most important event of all was the lowering of the infantile mortality-rate. This seems to have been in large measure brought about by better feeding, the improved supply of milk and of fresh vitamin-containing foods being due to advances in agriculture and cattle farming which occurred at this time. And not least important, epidemics of small-pox, which, throughout the eighteenth century had taken an enormous toll, especially of children, were much mitigated in severity by the introduction of vaccination.

This book is a valuable piece of research into a phase of our recent past which the historian of the future will probably regard as cririeal in the development of the present age.

TRADE DERMATITIS.

Schädigungen der Haut durch Beruf und gewerbliche Arbeit. By K. ULLMANN, in collaboration with M. OPPENHEIM and J. H. RILLE. Vol. III., Sections 1–2 and 3–6, in two paper-covered volumes with articles by numerous writers and many half-tone illustrations in the text. Leipzig: L. Voss. 1925–26. Sections 1–2, pp. 96; Sections 3–6, pp. 308.

THE increasing economic importance of industrial disease has created a general demand for statistical and other data. The scope of these volumes is by no means limited to the suggestions conveyed in the title, and although skin affections occupy the major space, there are articles by various experts of interest to ophthalmic and dental surgeons, to factory inspectors, and medical assessors. Research workers will find some valuable information in the studies included in the paper on "cancer as a sequel" in industrial disease. This article is profusely illustrated and well furnished with a bibliography, and is an important contribution to a question much studied at the moment. An article on prophylaxis is well conceived, and is followed by a summary of the regulations (German and foreign) which have been drawn up from time to time with that end in view. There is a short dissertation on treatment.

The classification of the various articles appears to be somewhat haphazard, and there is no evidence of a guiding hand or plan in their selection. The work as a whole must be regarded rather as a compilation than a text-book, and an introductory paper or editorial preface would greatly improve a future edition.

DISEASES OF THE EYE.

Fifth edition. By Sir JOHN HERBERT PARSONS, C.B.E., D.Sc., F.R.C.S., F.R.S., Ophthalmic Surgeon, University College Hospital; Surgeon, Royal London (Moorfields) Ophthalmic Hospital. London: J. and A. Churchill. 1926. With 21 plates and 343 text-figures. Pp. 676. 19*s*.

THIS book contains the information that the average student is likely to require without being so bulky as to frighten him. The fifth edition does not greatly differ from its predecessors. There are 23 extra pages which include 17 extra figures, some of which illustrate the use of the slit-lamp for displaying the intimate structure of the lens or the exact depth of a foreign body in the cornea; others reproduce some valuable pathological sections by the late George Coats, illustrating the microscopical appearances in vascular diseases of the retina. These subjects cannot be more than lightly touched on in a book of this scope. The author's views on the pathology of retinitis pigmentosa or of angioid streaks in the retina are not universally acceptable. Some operators, again, though not many in this country, might demur at the somewhat cavalier way in which the newer operations for intracapsular extraction of the lens are dealt with, while other authorities might consider too dogmatic the advice given as to the treatment of difficult cases of sympathetic ophthalmia—to excise the wounded eye, even when it retains sight, the moment there is the slightest sign of ciliary irritation or keratitis punctata in the fellow eye. But a text-book is no place for the exhaustive discussion of controversial matters. The student has to learn some time that opinions on certain parts of ophthalmology are not unanimous, and it is on the whole desirable that he should realise this at an early stage of his career. For a practical guide to the subject, however, he has in this book all that he is likely to require before he begins to specialise, and no one could wish for a more concise and readable exposition of the present-day orthodox teaching of ophthalmology.

ASTIGMATISM.

Die Bestimmung des Astigmatismus durch die Schattenprobe mit Cylindergläsern. By Prof. Dr. K. LINDNER, Director of the Eye Clinik in the General Polyclinik of Vienna. Berlin: S. Karger. 1927. With 83 figures, some coloured. Pp. 111.

THIS is a book well worthy of study by that increasing number of students and practitioners who aim at making the accurate determination of refractions an important part of their life work. It is easy enough to learn how to do a retinoscopy which shall be approximately accurate, but to attain precision is far more difficult, so much so that for what we may term the fine adjustment, many still prefer to rely chiefly on subjective tests. The matter becomes specially important in two classes of patients with antigmatism; first, those who are peculiarly sensitive to minimum degrees or minimum variations of the degree, and, secondly, those in which the axis of the astigmatism is oblique. When these two conditions are combined the case presents the maximum amount of difficulty. Prof. Lindner has specialised in the teaching of retinoscopy, and we know of no book in which the niceties of the method are better explained and illustrated. Especially is this true with regard to the determination of the angle, in which he makes great use of the "astigmatic band" and the variations in its direction which are produced by a cylindrical glass placed at an angle different from that of the astigmatism. For his methods the use of cylindrical glasses for the retinoscopy test is essential, and this will prove a difficulty in hospital clinics where, as a rule, the retinoscopy box contains sphericals only. For learners the author strongly recommends an artificial model. This book should prove of great value to readers who desire to do the best possible work as refractionists.

MOSQUITO REDUCTION AND MALARIAL PREVENTION.

By J. A. CRAWFORD, M.B., Ch.B. Edin., Captain, R.A.M.C.; and B. S. CHALAM, L.R.C.P. & S. Edin. London: Humphrey Milford, Oxford University Press. 1926. Pp. 102. 4*s*. 6*d*.

OF elaborate general treatises on malaria and its prevention there are enough, but these have been for the most part unintelligible to the layman. In this book the authors explain in non-technical language the simple facts of practical anti-mosquito work in the field. It is designed to be a suitable source of instruction for the manager of a tea estate, a sanitary inspector, or a non-commissioned officer of a regimental sanitary squad, and deserves to be appreciated by these. Though this book is intended for those who have to combat the mosquito pest abroad, it may be informative to local authorities at home, to supplement the pamphlet published on this subject by the British Museum, to which the Minister of Health had occasion to refer in the House of Commons on March 1st. It is obviously impossible entirely to avoid the use of scientific names, but it would have been better to describe the appearance and habits of larvivorous fish in English rather than to record them in doggerel Latin. More attention might have been paid to the illustrations—the line-drawings of the developmental cycle of the mosquito are not very good. A synoptical table of the differential characteristics of the Indian anopheline mosquitoes completes a useful work.

MODERN CLINICAL SYPHILOLOGY.

By JOHN H. STOKES, M.D., Professor of Dermatology and Syphilology in the School of Medicine, University of Pennsylvania. With the coöperation of PAUL A. O'LEARY, M.D., WILLIAM H. GOECKERMANN, M.D., the Mayo Clinic, LODEN W. SHAFFER, M.D., and CLEVELAND J. WHITE, M.D. London and Philadelphia: W. B. Saunders Company. 1926. With 865 illustrations and text-figures. Pp. 1144. 55*s*.

SO many text-books on syphilis have been produced in recent years, repeating the same facts in very much the same way, that it seems almost impossible that welcome could be found for yet another. This book, however, differs from most of its predecessors in important respects, notably in that the reader gets the impression that the authors have had vast experience in the disease. The views put forward are essentially those of Prof. Stokes himself; while an account of alternative views would often have been useful, we can hardly regret the condensation which has enabled him to produce a readable work in one volume, which is nevertheless unusually complete. If we have any fault to find with the book, it is with the presentation on so many pages of differences in symptoms and signs arranged in tabular form. This is not an attractive way of setting out information, though it may be justified on the ground that this it saves space. The sections dealing with neurosyphilis are outstanding in a work which has unusual merit.

HEALTH.

Resistance to Disease: a New Orientation. Second edition. By HARRY MERRALL, M.B., Ch.B. London: Williams and Norgate. 1927. Pp. 181. 6*s*.

Dr. Merrall is impressed by the fact that the alimentary tract is more or less lined from end to end with lymphoid tissue, and he regards the leucocytes which, he says, are derived from that tissue to be one of the most important defences of the body against microbic invasion. He believes also that intestinal toxæmia is the source of many ills and that iodine is an element necessary to salvation. He urges, therefore, that people should keep themselves healthy by seeing to any catarrh, and especially by swabbing the throat with iodine and glycerine, and by keeping their bowels open by belly exercises.

His advice has evidently proved so attractive that this revised, enlarged, and cheaper edition of his book appears two years after the original version. It is difficult to understand why he should begin with such a proposition as "our conception of the occurrence and development of disease is in the main erroneous," and why he should call his book "a new orientation." It is a pity, too, that his good, practical suggestions should be backed up with a physiology and pathology which are too often questionable. But we can well imagine that there is a common type of lay reader to whom he will appeal with much success and improvement in healthiness, and, since other opinions are to be had in times of trouble, he is not likely to lead anyone very far astray.

RADIOTHERAPY.

La Roentgenthérapie des Epitheliomas Cutanes et Cutaneomuqueux. By Dr. GEORGE GIREL. Paris: Masson et Cie. 1926. Pp. 301. 5*s*.

THIS book gives a detailed account of the methods evolved by Dr. J. Cost, of Lyon, for the radiotherapeutic treatment of malignant diseases of the skin. This method, as distinct from those usually employed, may be summarised as the use of rays of medium wave length, unfiltered and in massive doses given at a single application. An average dosage would be 25-30 H. in a single sitting, using a 6½ in. gap, no filter, at a distance of 22 cm. with 2 ma. going through the tube. This dosage produces, the author states, a "radio-epidermite" as distinguished from a "radio-dermite" or reaction of the third degree followed by ulceration and necrosis. He claims 98 per cent. of success, and complete cicatrisation in about one or two months after the date of treatment. A long list of cases is given in detail, from which it appears that some burns were produced. This, however, is attributed to a particular tube which was old. Pilon, ordinary and 30 ma. Coolidge tubes were used. The method seems to us drastic, and the risk of serious X ray burns unduly great; no doubt in the hands of its formulator it is successful.

In the second part of the book practical details are given to show that the method can be carried on with the simplest of apparatus. The remaining space is devoted to a histological study of the tumours treated and to their classification.

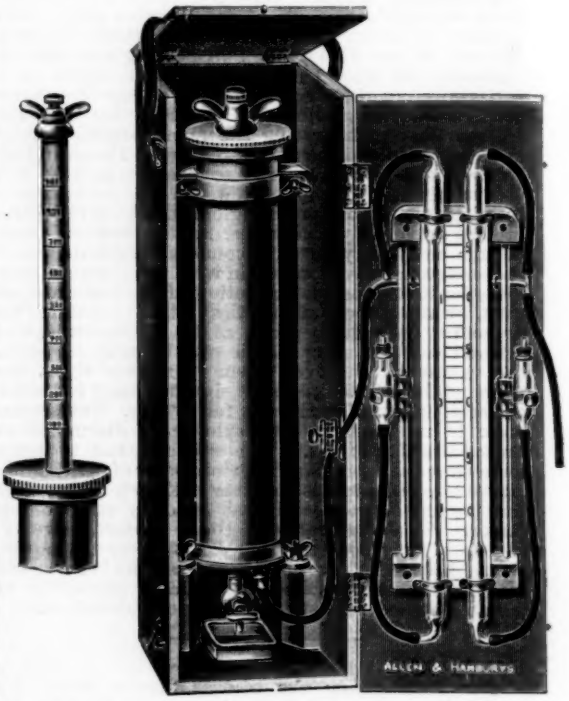
New Inventions.

AN IMPROVED PNEUMOTHORAX APPARATUS.

THIS artificial pneumothorax apparatus was suggested and designed for me by Miss V. Holmes, B.Sc. (London), to overcome two of the shortcomings of existing instruments—namely, fragility and the necessity for manipulation during the operation to maintain a constant flow of air at even pressure.

The apparatus consists of a carefully ground brass cylinder topped with a flat cap. The lower end is filled with a sump in the shape of an inverted cone, with a stop-cock at the extreme lowest point, and a nippled opening at a slightly higher level. The cylinder is fitted with a hollow brass piston, to which is mounted a hollow piston rod whose lumen is continuous with that of the hollow piston. The piston has circular grooves, and from the bottom of these grooves holes are bored through to its central chamber. The top end of the piston rod is fitted with a simple device for locking it to the cylinder top when the piston is at the bottom of its stroke, and also with a knurled screw to seal the open end. The piston chamber is filled with castor oil via the piston rod, and this oil flows into the piston grooves through the holes mentioned above. This gives a perfect airtight fit, and at the same time permits the piston to fall smoothly but quickly by its own weight. The cubic content of the cylinder is about 700 c.cm. and the piston rod is graduated to show the cubic content of air at atmospheric pressure at any position of the piston. From the nippled opening in the sump a rubber tube runs to a metal tube in the box lid, which metal tube has two side openings connected by rubber tubes with the manometers. A further rubber tube passes from the metal tube to the patient. The flow of air between the cylinder and the metal tube in the lid is controlled by a simple screw clamp.

To operate the screw clamp is closed. The stop-cock in the sump is opened (any excess of castor oil in the sump will then drain out) and the piston is raised to the top of the cylinder; the stop-cock is closed, and the piston allowed to settle, compressing the enclosed air. The pressure exerted by the piston is equal to about 50 cm. of water. The rubber tube leading to the patient is fitted with a needle and introduced; the screw clamp is released until it is seen



from the movements of the piston rod that air is flowing at the desired pace. The pressure at the needle point varies with the rate of flow, and can be set at any pressure from ¼ cm. of water to the full capacity of the manometers, according to the amount the screw clamp has been released. The quantity of air used can be read from the piston rod graduations.

Any form of manometer can be used. The one illustrated is a copy of that used on Dr. Parry Morgan's old apparatus. The manometer nearest the cylinder is filled with a mixture of oil and chloroform of sp. gr. 1000, the one nearest the patient with coloured water. During the operation, the water manometer fluctuates freely with the patient's respiration, showing the pressure at the needle point. The oil manometer scarcely fluctuates with respiration, and before the screw clamp is opened is set to the patient's mean intrapleural pressure, and continues to show this throughout the operation, provided that the oil used is not too viscid and the air is not introduced too rapidly. If another clamp is introduced on the rubber tube between the cylinder and the screw clamp, and a needle is fitted at the patient's end, the screw clamp can be so adjusted that any pressure can be maintained at the needle point; the second clamp can then be used for starting and finishing the operation. This method is useful for induction, as it allows the gas flow to be controlled instantaneously, or when a series of refills are to be done, as it saves the time needed for constant readjustment of the screw clamp.

If the instrument is used as illustrated, it is unnecessary to touch it at all during the operation, except to open the screw clamp at the start, and to close it when sufficient air has been introduced, and the operation need not be interrupted for pressure readings, as the mean intrapleural pressure at any moment is visible on the oil manometer.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W.

R. C. WINGFIELD, M.B., B.Ch. Oxf., M.R.C.P. Lond.

THE LANCET.

LONDON: SATURDAY, MARCH 19, 1927.

CHEMICALS IN BREAD.

THE Departmental Committee on the Treatment of Flour with Chemical Substances has now presented its Report.[1] The Committee was appointed in July, 1923, to inquire into the use of preservatives and colouring matters in food, and the final report on this general inquiry has already appeared[2]; but in June, 1924, the reference was extended to include the question whether and to what extent the practice of treating flour with chemical substances is objectionable on grounds of health and whether it is desirable in the interests of the public health that the practice should be prohibited or restricted, and in the latter case what restrictions should be imposed—and the present Report deals exclusively with the supplemental reference. This inquiry has been long and difficult. A considerable part of it was necessarily of a technical character, commercial considerations have intervened in large measure, and the question has involved applied chemistry in a field where exact knowledge is difficult to come by and accurate deduction still more difficult to make. The Bread Acts of 1822 and 1836 made it a legal offence to sell bread containing—apart from its essential cereal content—any ingredient other than common salt, pure water, eggs, milk, barm, leaven, potato or other yeast, and the Food and Drugs Act of 1875 penalised the addition to an article of food of any ingredient so as to render that article injurious to health; but there was a proviso in this Act permitting the addition of something, not in itself injurious to health, though required for the production or preparation of the food in a state fit for carriage or consumption; and finally an amending Act of 1922 sanctioned the addition of any ingredient for the purpose of making flour self-raising, subject to the power of the Minister of Health to prohibit or restrict a particular ingredient. Conformably to these legal provisions there has grown up during the last 20 years a widespread practice in this country of introducing chemical substances into flour for the purpose of bleaching or improving it. The practice of bleaching arose, it appears, in response to the large demand amongst industrial and manual workers in the north of England and in Ireland for a specially white flour, a demand which would otherwise have resulted in disastrous competition from the naturally bleached commodity offered by the flour importers. This type of addition may fairly be regarded as eyewash, being directed simply to the production of an appearance and not of a quality, but in regard to the so-called improvers the milling industry claims for them an enhancement of the natural baking qualities of the flour so as to yield what is regarded as a good loaf. Not all flours are capable of producing a loaf which rises well, is of a satisfactory texture, evenly aerated without large cavities or heavy streaks, and with thin, smooth, crisp, unbroken crust. Millers claim that the deficiency of any flour in the qualities necessary for making a good loaf can be remedied by appropriate chemical treatment, with the result—as was recently set out in our own columns [3]—that people are supplied with a pure loaf of better flavour and greater digestibility and consequently higher nutritive value.

The number of chemical substances at present in use is quite small, the list comprising little more than nitrogen or benzoyl peroxide for bleaching, acid calcium or ammonium phosphate and persulphates for improving, and chlorine or nitrogen trichloride for the dual purpose, known commonly as maturing. The present Report takes as read a report presented to the Local Government Board 15 years ago by Dr. HAMILL (which described in detail the structure of grain and flour and the processes of modern milling) and devotes its attention to the improvement of flour by chemical means, a practically new field now being developed by cereal chemists on the scientific as well as on the empirical side. The Millers' Association have as the result of laboratory investigation developed widely the practice of building up blends of flour in which one unit makes good the defects of another, the chemical improver being brought in finally to correct any defect found in the baking test applied to the composite flour. The hydrogen-ion concentration of the top grades of flour is greater than that of the lower grades and the improving, stated in chemical terms, may be a result of bringing this concentration to the appropriate level of about pH 5·5, associated probably with some oxidation of the gluten which there is good reason to believe occurs in two distinct forms. The Committee does not doubt that the use of improvers has been a valuable aid to home millers in competition with overseas supplies, and their employment enables the miller to use any supply of sound wheat available, taking advantage of whatever comes to hand and producing a standard flour at the lowest prices. This, it is admitted, may result in the more extended use of what millers call inferior wheats, although it should be understood that this commercial inferiority does not imply a lesser nutritive value. Bleaching affords the miller the opportunity of eliminating the difference between higher and lower grades of flour from the same wheat, so that by appropriate treatment flour which would otherwise have to be sold as "household" can be lifted into the "patent" grade.

After thus clearing the ground the final section of the Report deals with the health of the consumer, which was the avowed object of the inquiry. It has been notoriously difficult to demonstrate that the addition of minimal quantities of a foreign ingredient to any staple article of diet is deleterious, and precisely for this reason a Government amendment has just been introduced at the Committee stage of the Sale of Food and Drugs Bill now before the House of Commons, the purpose of which is to save local authorities from having to prove in any particular instance that the presence of a forbidden preservative, or the excessive amount of a restricted preservative, is injurious to health. The view of the Departmental Committee, frankly stated in so many words, is that flour should be a product of the milling of wheat, without the addition of any foreign substance, but after stating this principle they were confronted at once with the difficulty that to insist upon it would be to waste supplies of wheat and to raise the price of flour. So long as a great demand exists for very white breads, they admit that some form of bleaching process must be permitted. Whatever may have been alleged to the contrary, the Committee regards the majority

[1] The members of the Committee were Sir H. C. Munro (Chairman), Prof. W. E. Dixon, Sir A. D. Hall, Dr. J. M. Hamill, Mr. O. Hehner, F.I.C. (replaced later by Mr. P. A. Ellis Richards, F.I.C.), Prof. F. G. Hopkins, Dr. G. R. Leighton, Dr. A. P. Luff, Dr. C. Porter, Mr. G. Stubbs, F.I.C., with Mr. A. M. Legge, Secretary. Ministry of Health, 1927, H.M. Stationery Office, 6*d*.

[2] THE LANCET, 1924, ii., 929.

[3] THE LANCET, 1920, ii., 1038.

of added substances as foreign to flour, for the phosphorus and sulphur found in the ash of untreated flour do not seem to be present in the form of phosphates or sulphates in the flour itself. They suggest that chlorine, besides combining with carotin to form a colourless addition compound, does also combine to some extent with the oil of flour and may in so doing injure the nutritive value of the gluten by the entrance of chlorine into the tyrosin and tryptophane groupings. Direct experiments of feeding rats on flour treated with chlorine or nitrogen trichloride were inconclusive, but judging by all the evidence before them they regard both chlorine, whether free or combined with nitrogen, and benzoyl peroxide as undesirable additions to flour. They are not prepared to recommend the complete elimination of the bleaching agents and improvers now in use, but they think it should be made conpulsory on manufacturers to declare to purchasers the precise ingredients of their wares, and equally compulsory on millers to inform their customers whether their flour has undergone a process of chemical bleaching or improving or both, and if so with what substances and in what proportions. There are bakers, the Committee state, who wish to know the nature of the materials they are using, and who want flour, and not a mixture of flour with something else. Finally, they welcome the possibility shown in their inquiry of improving flour by physical rather than chemical methods, and are impressed by the success which has already attended these experiments on a commercial scale. Before proposing these very modest limitations on the liberty of the miller to add to flour what chemical substances he will, the Committee had ascertained that in Australia and New Zealand the artificial bleaching of flour is prohibited and bread may not contain any foreign mineral substance other than common salt. Switzerland also forbids bleaching. Canada has, however, recently recognised the practice of bleaching with a minimal amount of nitrogen peroxide if so stated when the flour is sold, and the United States of America, as well as Switzerland, have sanctioned the addition of limited amounts of unobjectionable salts serving solely as yeast nutrients. The Report is now open for the consideration of a public, every member of which consumes bread in larger or smaller degree, and is affected in mind, body, or estate by the practices which the Committee was appointed to investigate.

MEDICAL EDUCATION IN THE U.S.A.

MEDICAL education in the United States of America is regulated largely by the specifications and rules of several different agencies, one among which, the Association of American Medical Schools, has devoted itself particularly to the problems of the ideal curriculum and to the inspection of medical schools. A committee of the Association in 1925 called together a group of persons representing general and scientific education, the medical profession, and the related sanitary interests, and organised a Commission on medical education. That body has now issued a report, derived from a preliminary study of some of the general questions which have been considered, promising that, as more material is assembled and other studies made, additional reports will be published. The first document is so practical that its sequels will be looked for, and the medical schools having part in the Association, as well as the Rockefeller Foundation, the Carnegie Corporation, and the American Medical Association, may be congratulated on finding the financial support for such useful endeavour. The initial stage of the labours could not have been easy, for the Commission in certain directions pre-supposed an inspection of medical schools, and not only of the examinations instituted by the various qualifying bodies; and to bring schools up to a certain level may be harder than to evaluate their respective efforts by criticism of the different methods of testing. Further, the local adaptabilities for medical practice in the United States have to be borne in mind, for, despite similarities of pattern that may exist in many localities, each State has developed its own requirements, which have exerted a considerable influence both on the domestic details of the curriculum and on the legal status of the schools.

The report commences by a shrewd definition of the proper objective of medical study and a fair summary of this section would be as follows. The medical training given to the student should be sufficiently broad, while perfectly sound, to serve as the groundwork for subsequent development; it should provide students with the training needed for competence to begin practice, while preparing them also to make general or special use of their developing clinical insight and experience. The sections of the document dealing with the various circumstances which determine the chances presented to the medical profession of doing their work in the most efficient way and for the good of the public, follow lines which are familiar to all who have studied analogous problems in this country, but the action of the Commission here has been thoroughly practical. To obtain information on the demands for medical services, the coöperation was enlisted of 500 recent medical graduates practising in communities of 50,000 or less in a group of 24 States and two Provinces. A study of the activities of these men has revealed that 90 per cent. of the cases requiring treatment could be adequately cared for by the practitioner who had received the medical training that is provided in those States through the medical licensing boards. The patients presented themselves in the rough numerical proportion of 55 per cent. at the doctor's residence; 35 per cent. were domiciliary visits, and 10 per cent. institutional cases. As might be expected, three-quarters of the cases visiting the doctor had minor surgical injuries, while the domiciliary visits were in respect mainly of infections of the respiratory tract, medical conditions, zymotics, and obstetric patients, only 10 per cent. falling under more special designations. Further light is thrown on the health needs of the American population by an analysis of the defects found through recruiting statistics. A report of the Surgeon-General of the United States Army has analysed the records of 2,750,000 of those men; they reveal that 46 per cent. had defects of one sort or another. A more detailed analysis of this enormous figure would show, of course, that many persons categorised as "having defects," would exhibit no immediate need of medical attention, while in many the time would have gone by for fruitful treatment. But even so, the residue will be very large, and the Army figures confirm the necessity existent in the States for many doctors properly standardised and properly distributed. An interesting comparison is made in the report with medical practice in Great Britain, for the demands on American and Canadian practitioners are contrasted with a survey of the causes of illness which led persons to consult practitioners under the National Insurance Act, as set out in a recent report of Sir GEORGE NEWMAN. The British, American, and Canadian figures have close general resemblance, the dis-

crepancies in the incidence of nervous and venereal diseases being accounted for probably by differences in nomenclature.

We note that the report appears to lay the responsibility upon the medical profession for the proper distribution of practitioners, but it seems to us that this is a mattter in which the public should take the initiative. Throughout the United States the growth of population in the towns in comparison with that on the countryside—a position the embarrassments of which we know very well in this country—has led to the fact that there are many localities which are not properly staffed by medical men as well as devoid of institutional and nursing amenities. Notably it is the older doctors who resort to or who remain in the country, a fact which had been elicited by Dr. W. A. PUSEY in a study of 283 rural counties in 41 States, which he published in the *Journal of the American Medical Association*. This investigation indicated the average age of physicians practising in these country districts to be 52 years, and the average period which they remained in practice to be 26 years. This study brought out further that only 9 per cent. of the 4410 physicians practising in these counties were graduates of the last ten years, and that no recent graduate had gone into 35 per cent. of these counties during the same period. A recent study of conditions in the State of Michigan showed that in 1925 the largest number of physicians at any one age was in the period of 50 to 54 years, whereas in 1914 the largest number of any one age was in the period of 35 to 39 years. The figures are revealing as to the position in the vast Transatlantic countries; in Great Britain it is only faintly reflected, as only in a few areas does country practice mean the extreme isolation indicated in Dr. PUSEY'S inquiry. There is reason to think that with us the position, so far as it existed, is righting itself under the National Insurance Act.

THE MANAGEMENT OF PNEUMONIC PLAGUE EPIDEMICS.

WHATEVER Government rules China that country must long be a source of anxiety, from the sanitary point of view, because North Manchuria still harbours the Siberian marmot or tarbagan, an animal peculiarly susceptible to natural infection by plague. The pneumonic plague epidemics of North China can all be traced back to this small rodent and to the hunters who trap it for fur. In the great Manchurian outbreak of 1910–11 Dr. Wu Lien-Teh (better known in Europe as Dr. W. L. Tuck) played a memorable part, and the lessened severity of the two later epidemics was due largely to the combative measures adopted and directed by him, and to the standing anti-plague organisation whose inception and maintenance owe so much to his efforts. Pneumonic plague is not confined to North China; it is perhaps even more rampant now than in the past, and Dr. Tuck's latest contribution[1] to the literature is welcome. It is the fruit of an unrivalled experience of three great epidemics and of a thorough exploration of what is already on record. The result is an authoritative work. It is dedicated to the known and unknown who have sacrificed their lives fighting or investigating pneumonic plague, and in the last 14 years most of these must have fallen actually by the side of Dr. Tuck.

Not rarely pneumonic plague has been frequent in newly invaded areas, but has later become inconspicuous in the same foci; this was noticed, for example, during the Black Death pandemic. It is by no means clear how an outbreak starts. Racial susceptibilities cannot play any important rôle, but climatic conditions may enhance the susceptibility of the lungs, aggravate the bad social conditions which impair individual resistance, and by leading to overcrowding, increase the chances of contagion. There may even be a special character in the epizoötic. The nature of the epidemic itself is determined by a chain of circumstances, perhaps peculiar to each locality and community. Although it is true that an outbreak of plague pneumonia may, of its own accord, decline and disappear, this is no excuse for neglecting stringent measures to suppress it. Treatment is difficult, for the infection is one which, in its selection of the lung for primary attack, is too rapid and severe for any remedy yet discovered; in the overwhelming majority of cases of manifest plague pneumonia immune serum has failed to be of benefit. In view of the difficulties, an epidemic must be fought not by one invariable scheme, but by a combination of methods adapted to the locality, the season, and the particular traits of the afflicted populace. For personal prophylaxis the best measure is the wearing of a protective mask. Its use dates back to 1348 and the Black Death in Europe, at which time it evidently became widely known that infection was directly transmitted through the air. In the three Manchurian epidemics a mask of absorbent cotton-wool, tied over mouth and nose by a many-tailed gauze bandage, was evidently efficacious; it is probably impervious to cough droplets, though tests have proved that it lets through the smaller drop obtained by artificial spraying. A hood of heavy flannel cloth tied at the neck and fitted with mica window withstands far severer tests and is not more inconvenient or uncomfortable than the gauze cotton-wool mask. Everyone in any epidemic area is obliged to avail himself of this protection all the time, whatever the duty or common task. What more obvious or safer insurance can there be against a coughing neighbour? The occurrence of many laboratory fatalities imposes it even on the secluded pathologist staff. Personal protection by immune serum, or plague vaccine, or both, is less certain, though these measures undoubtedly lengthen the incubation period. At least 100 c.cm. of the serum must be injected as soon as possible after exposure to infection, and this dose will confer some passive immunity for possibly as long as two weeks. Thousands of people may need injection and the cost of serum is high. Experimental data, says Dr. Tuck, are but little in favour of vaccine. In natural circumstances, however, the infective dose is rarely so massive as that given by inhalation to animals in experiments, and in the pneumonic epidemics plague vaccine seems to have given better results than might have been expected on theoretical and experimental evidence. It is not to be discarded in spite of the grim fact that in epidemics some of the fully vaccinated sanitary personnel have succumbed to plague pneumonia.

General prophylactic measures are, at best, only palliative. Pneumonic plague is secondary to human bubonic plague, which in turn arises from plague in rodents, and the preventive measures should ideally be directed against these two precedent infections. The different branches of the anti-plague organisation should, in Dr. Tuck's opinion, be directed by a single chief medical officer. The coöperation of medical practitioners is readily obtained, whilst that of the population has to be sought by educational measures. Cases must be detected promptly—which means house-to-house inspection—and isolated in hospitals or camps. Contacts must be placed under strict medical inspection in segregation quarters for at least seven days, or for ten days if they have been vaccinated or protected with serum, so that the incubation period may be prolonged. It is a natural instinct to flee from plague-ridden localities, and flight has been recommended from Biblical times; Cardinal Wolsey followed his own advice for time of plague—to change quickly to fresh and purer

[1] A Treatise on Pneumonic Plague. By Wu Lien-Teh. Published by the League of Nations Health Department. 1926. Obtainable in Great Britain from Constable and Co.

air. Evacuation of the people is nowadays done to remove them from insanitary and overcrowded dwellings and bring them to camps where better hygienic conditions can be arranged, and where medical inspection can be carried out as though all of them are contacts. Experience has fully confirmed the value of these measures; properly conducted, they have always led to a quick decline of the epidemic. Churches, schools, and theatres must be closed. Cordons within the affected area to limit infection to that area may assist; but the plan of shutting up patients or contacts, or both, within their own houses is too cruel to deserve a place among modern methods of prevention. It is of interest to recall, however, that in 1348 the Pope and his household escaped the Black Death by closing themselves up in the Palace at Avignon. Disinfection should be carried out with discretion and common sense, for little remains to disinfect once the coughing patient, the main source of infection, has been removed. Dead bodies should be cremated, for they teem with plague bacilli, and these in suitable climatic conditions retain life and virulence for long periods. Pneumonic plague spreads not only creepingly from house to house, but also by jumps; someone from a stricken community while incubating plague may travel to a distant place and there cough in a neighbour's face. An efficient cordon should prevent this kind of spread, but some control of traffic from the infected area has to be instituted. It is clear that the methods now available for the suppression of the disease do not guarantee its speedy disappearance. A more timely and universal detection will prevent widespread epidemics, and must be relied on until such time as bubonic plague and rodent epizoötics can be eradicated.

Annotations.

"Ne quid nimis."

THE REFUTATION OF A SCARE.

IT appears that wide circulation is being given in America to statements likely to give rise to the belief or the fear that vaccination against small-pox may cause syphilis. There is available in the public services a mass of direct evidence in refutation of this idea, and the three Directors-General have considered it their duty to issue a public statement that syphilisation as a result of vaccination does not occur. In the days of arm-to-arm vaccination cases of syphilis following inoculation with human vaccine did occasionally arise, although extremely rarely. Syphilis, however, being confined in nature to the human species alone, the possibility of its transference by vaccination was entirely done away with as soon as the use of calf vaccine became universal. Since 1917 the United States Army has vaccinated approximately 4,700,000 members of its personnel; the United States Navy has vaccinated approximately 950,000 of its personnel; and of these 5,650,000 persons not one developed syphilis as a result of vaccination. In not one of them was there ever any suspicion of syphilis in connexion with vaccination. During this same period the United States Public Health Service vaccinated 2,918,748 persons in carrying out its quarantine, immigration, and hospital work. While the Service has not always had the opportunity of following up these vaccinations, as is carefully done in the Army and Navy, no one has ever alleged that any particular individual vaccinated by the Public Health Service has contracted syphilis as a result of vaccination. During the past ten years more than 2,000,000 persons, including school-children, have been vaccinated by State and local health authorities in coöperation with the United States Public Health Service, making a grand total of 10,568,748 vaccinations recorded by the Government medical services, and not one of the undersigned has ever received an allegation or a statement charging that any particular individual of this number has contracted syphilis as a result of vaccination. In fact, there has never been reported anywhere a case of syphilis attributable to vaccination following the use of bovine small-pox vaccine.

Small-pox vaccine is a standard medicinal product, the quality of which is prescribed by the United States Pharmacopœia, and as such is subject to the provisions of the Pure Food and Drugs Law. Furthermore, small-pox vaccine, together with other vaccines and serums for human use, has been deemed of such importance by the Government that its production for sale within the jurisdiction of the United States has been under the special protection of an Act passed July 1st, 1902, antedating even the Pure Food and Drugs Law. Under this law all establishments producing small-pox vaccine for inter-State sale must be licensed by the Secretary of the Treasury upon the recommendation of the United States Public Health Service, and the production is controlled by regulations drawn up by a board composed of the undersigned. These regulations provide for repeated inspections of the producing laboratories, for proper labelling, and for all safeguards which may be thrown about the making of such an important product. At present even the placing of the vaccine in the small tubes and the sealing of these tubes is required to be done in such a way that no hand, even though sterile, touches the vaccine. Repeated examinations of the product, for safety, are required. This vaccine, it is stated, was used in the vaccination of the millions mentioned, and is exactly the same as that used by doctors in private practice in the vaccination of the general public throughout the United States. The statement is signed by M. W. Ireland, for the U.S. Army, E. R. Stitt, for the U.S. Navy, and H. S. Cumming, for the U.S. Public Health Service.

SQUINT

IT has been said that no baby is born with a squint, and this is roughly true, inasmuch as in the absence of either a deformity of the skull or an anatomical malformation of the eye-muscles—both very rare conditions—the visual axes of the two eyes are always approximately parallel at birth. The cerebral centres for the coördination of movement of the two eyes are sufficiently developed to keep them approximately parallel, as a rule, but during the first few weeks or months of life this approximation is by no means exact, and young infants are frequently noticed to squint occasionally, a circumstance that need cause no anxiety unless it persists. During this period the infant is literally learning to see. If the visual axes of the two eyes are not directed towards the same point of any object—say a rattle—it appears double, but the infant soon learns by the sense of touch that he has only one rattle, not two, and by instinct brings the muscles of his eyes to confirm what his hands have told him. The power of binocular vision, however, is as yet far from being fully acquired. The images of any object towards which the two eyes are directed are slightly different because they are formed at different angles. The power of combining these two images into a perception of the object is known as the fusion-sense and it takes years to acquire. Some children, and particularly members of some families, never acquire it, and in its absence various factors sometimes combine to cause a squint. The close association between convergence and accommodation is the best known of these factors, so that hypermetropic children whose fusion-sense is defective are peculiarly liable to it. Not all squinters are hypermetropic, however, and another frequent factor in the causation of squint, of at any rate equal importance, is an unusual call on the nervous system such as a sudden fright or an attack of measles. If the fusion-sense is already well developed the unconscious effort

to see binocularly is sufficient to prevent the child from squinting; but if the fusion-sense is absent or badly developed, the mechanism which coördinates the lateral eye-muscles may easily be thrown out of gear. As most children are hypermetropic the squint is generally convergent, but it may be divergent. In either case, when a squint is well established the attention of the child is so concentrated on the image in the better eye that the one formed in the retina of the worse eye is not attended to at all. It is "suppressed," and if this suppression is allowed to continue the eye often becomes incapable of any useful vision. It is this fact that renders it so essential that all squints in children which are constant should be treated without delay—not by operation, in the first place at any rate, but by glasses, and, if necessary, by forcibly suppressing the image not of the squinting eye but of its fellow. If one eye is blind from infancy it may or may not squint. If it does, the squint is generally convergent at first, but in later life may become divergent. Similarly, if both eyes are blind from infancy they may or may not squint, but in this case the reflex stimulus to the coördinating mechanism having never been in action, the latter is so far put out of gear that there is almost always nystagmus. If, on the other hand, as in those who become blind after early childhood, the coördinating mechanism has once been firmly established, it almost always continues to function, even in the absence of the sight of either eye. Cases of optic atrophy seldom either squint or have nystagmus. In myopia a squint is usually divergent but as myopia is almost never present in infancy this is only seen in adults as a rule. A single blind eye, whether myopic or not, often diverges in adult life, but in children will as often be found to converge.

THE ÆTIOLOGY OF ADDISONIAN ANÆMIA.

IT is well over 30 years since Herter postulated a relationship between the abnormal activities of *Bacillus welchii* in the large intestine and the occurrence of pernicious or Addisonian anæmia. So completely has his work fallen into oblivion that in recent and authoritative English and German text-books on diseases of the blood no mention of the theory is to be found: and in this country at any rate, the presence of hæmolytic streptococci in the duodenum attracts a large share of the attention of those who look upon the disease as an infection. The work of Cornell [1] in Canada, published two years ago, indicated an attempt to rehabilitate Welch's bacillus as the only source and begetter of Addisonian anæmia, and have inspired efforts by several other investigators to establish a relationship. Thus Moench, Kahn, and Torry [2] have shown that *B. welchii* are present in the intestines of sufferers from the disease in larger numbers than in those of normal persons, and by injecting into monkeys small quantities of toxin derived from the bacillus, Kahn and Torry [3] were able to produce a blood picture closely resembling that of Addisonian anæmia.

Following the lead of Cornell, who showed that it is possible to establish a chronic *B. welchii* infection in rabbits, Reed, Orr and Burleigh [4] working at Queen's University, Kingston, Canada, have observed the blood changes produced by the activity of this organism in the tissues of the host. By using cultures kept for five to ten days in the ice-chest, and injected hypodermically or intramuscularly into rabbits, they found that they were able to produce local lesions from which complete recovery frequently took place. The inception of the infective process was characterised by constant and well-marked changes in the blood picture. The notable change was a gross anæmia in which the red cells might fall as low as 1,400,000 per c.mm., and as this was not accompanied by a corresponding decrease in hæmoglobin the colour-index was relatively high. Some poikilocytosis was also observed, and a high degree of anisocytosis. Averages were taken of the size of the red cells, and curves were plotted showing the relative distribution of cells of various sizes. These curves differed grossly from those found in normal rabbits and approximated in their shape to the curves shown by Price Jones [5] to be characteristic of Addisonian anæmia. Films of blood from the infected rabbits further showed nucleated forms, many of which resembled the megaloblasts which are usually regarded as one of the most typical features of the blood picture in human pernicious anæmia. This, however, is the full extent of the resemblance between the blood of the infected rabbits and that found in the disease, and the rabbits showed a leucocytosis instead of the leucopenia which might have been expected. As no differential counts are recorded, it is impossible to say whether they had a relative lymphocytosis.

These various investigations seem to show that in experimental animals the toxin of *B. welchii* can be made to produce a blood picture characterised by a high colour-index, and a Price Jones curve resembling that of Addisonian anæmia. This, however, is far from proving that *B. welchii* is the cause of the disease. The term "Addisonian anæmia" in the present state of our knowledge merely denotes a symptom complex which may have many causes. It is recognised, for instance, that infestation by *Bothriocephalus latus* will give rise to the characteristic blood picture, but this does not mean that all patients having this blood picture are suffering from such infestation, and the same holds true for Welch's bacillus. None the less, this is a matter which will obviously repay further investigation. In view of the well-known fact that anæmia due to hæmorrhage will produce alteration in the size of the red cells in rabbits, it is probably desirable that such work should be conducted on some other animal, and since highly potent preparations both of *B. welchii* toxin and antitoxin are now readily obtainable, no advantage is any longer likely to be gained by injection of the living organism.

[1] Can. Med. Assn. Jour., 1925, xvi., 26.
[2] Jour. Infect. Dis., 1925, xxxvi., 425.
[3] Proc. Soc. Exp. Biol. and Med., 1925, xxiii., 8.
[4] Can. Med. Assn. Jour., 1926, xvi., 525.
[5] Jour. Path. and Bact., 1922, xxv., 487.

A BELGIAN HEALTH DEMONSTRATION.

THE idea of health demonstrations originated in America, where the best-known, the Framingham Antituberculosis Demonstration, consisted of an intensive public health campaign within a limited area aimed at the improvement of public health and especially at the reduction of the tuberculosis mortality-rate. From the specialised demonstration America has passed on to the general public health demonstration, and at the present time the Milbank Foundation, with some millions of dollars at its disposal, is directing three simultaneous demonstrations—one in a rural area, one in a small manufacturing town, and one in a New York district. Such demonstrations, although their primary object is educational, are also of the greatest interest from the experimental point of view, for the demonstration area becomes, as it were, a laboratory of applied public health, and the research work carried on is likely to yield data which might otherwise take years to collect. It was inevitable that the health demonstration idea should, sooner or later, penetrate to Europe. To the Belgian Red Cross belongs the honour of having staged the first European demonstration, and the report just published of the Jumet Health Demonstration [6] has thus a pioneer interest. Jumet is a small industrial town between Brussels and Charleroi with 30,000 inhabitants. The demonstration, which is still in progress, was undertaken in 1923 by the Belgian Red Cross in coöperation with the League of Red Cross Societies, and with the hearty support of the local authorities and of the national

[6] La Démonstration d'Hygiène de Jumet, Croix-Rouge de Belgique, 1927. Paris: Ligue des Sociétés de la Croix-Rouge, 2, Avenue Vélasquez. Pp. 120. 2s.

public health organisations. A health centre was established in a specially erected wooden pavilion, a public health nursing service was organised, and a number of clinics were opened. The National Child Welfare Organisation started a clinic for expectant mothers, and another for children between 3 and 6, in addition to the babies' clinic and the school medical service which already existed. The National Anti-tuberculosis, Antivenereal and Mental Hygiene Leagues also lent their support and organised local clinics. A dental hygiene service was opened. The local Red Cross undertook the propaganda, organised a local Junior Red Cross Section in the schools, and obtained the support of teachers, clergy, employers, workers, mutual benefit societies, and the press. The staff of the demonstration consists of eight doctors in practice, three dentists, one head nurse, five visiting nurses, one nurse doing clerical work, and one social worker. The report states that out of the 14 medical practitioners at Jumet, eight have given their services daily to the demonstration, and the remainder have always been ready to lend their aid when the occasion arose. One of the most striking points of the demonstration is the institution of preventive medical examinations. In spite of the fact that this is an innovation not easy to popularise, at Jumet 1476 persons, or 5 per cent. of the population, voluntarily submitted to medical examination in 1925, although the examination was not free. Another interesting feature is the participation in the demonstration of the workers and employers through their unions. The glass-workers' union bought 700 health pamphlets for distribution among its members. The annual budget of the demonstration amounts to about £600, which works out at about 5*d*. per head of population. The report considers that the three main accomplishments of the demonstration so far are: (1) the establishment of coöperation between the various institutions and organisations which had been working along the same lines but without any unified plan; (2) the whole-hearted way in which the medical committee has entered into the demonstration, and the undertaking by doctors of preventive as well as curative work; (3) the awakening of a health conscience among the entire population, witness the fact that during 1925 40 per cent. of the inhabitants of Jumet sought the preventive services established for their use.

THE VOLUNTARY HOSPITALS IN 1926.

MANY of the voluntary hospitals are now holding their annual meetings, and although their printed reports are in most cases not yet available, it is possible to form a fairly trustworthy impression of their general situation at the end of 1926. Broadly speaking, they had a better year than might have been expected in view of the long period of industrial unrest caused by the mining dispute. The General Strike, during the short period for which it lasted, caused them serious inconvenience and sometimes sharp discomfort and, especially in the great towns of the Midlands and the North, the vast mass of unemployment produced by the closing of the collieries heavily reduced the receipts from those contributory funds upon which they are every year more closely dependent. Yet it would not be surprising to find, when the detailed figures of the year are published, that they increased their aggregate income, and that a larger number are able to present a clean balance-sheet as regards the cost of maintenance. Were it not so the outlook for the voluntary system would be black indeed, since expenditure must necessarily grow. It is not merely that everything costs more, but that no hospital is able to stand still. More patients and more clinical facilities react upon each other; the more hospitals can do for patients, the greater the number and the eagerness of patients. It is difficult for hospitals to economise in any direction, and in many directions it is undesirable that they should. Businesslike management is rapidly becoming one of the hospital fine arts, and it may be taken for granted that, broadly speaking, there is no waste of money in any direction. The hospitals must therefore look for increased resources. As regards current expenditure many of them are finding salvation in the establishment and enlargement of contributory schemes which possess the cardinal advantage of almost infinite elasticity. Soon they are likely to be universal.

The paying patient is beginning to acquire importance as a producer of income, and schemes of extension now very commonly include provision for him. This matter of enlargements raises very serious questions. Surplus income, when there is any, is usually not available for building new wards which, by reason of the growing costliness of their equipment, swallow enormous sums, and so far no substitute has been found for those "special appeals" which confront us daily. The contributory scheme and the paying patient are already with us, and both are growing in importance. But what of the patients who ought to be paid for but are not? They are pitchforked into the hospitals in more and more thousands every year as the result of speed-madness. They demand urgent attention, they cost much money, and lengthen those waiting lists which, when all reserves have been made, remain a sad reality. It has become urgently necessary to devise means for bringing a large proportion of accident patients into contribution, either directly or through the organisations in which they are insured. Meanwhile there is abundant room, not merely for congratulation, but for faith and hope. The voluntary hospitals, taken all round, have done unexpectedly well in a difficult year; on every hand plans for enlargement of buildings and improvement of equipment are being perfected. The resilience of the voluntary system is the most conclusive proof of its inherent value. So thoroughly, indeed, has that value been demonstrated that talk about the nationalisation or municipalisation of the hospitals has grown so faint as to be almost inaudible.

THE TREATMENT OF MENTAL DEFECTIVES.

THE Mental Deficiency Act of 1913 had good intentions. Conceived as a means of satisfying the two outstanding needs of the years preceding its contrivance it was hoped, first, to afford facilities for the better care and treatment of the feebleminded, and, secondly, to effect such arrangements as would ensure the transfer of their supervision and control from the legal to the medical authority. Unfortunately, this "charter of the feebleminded" had that within its constitution that was doomed to bring it failure. Time has shown that obvious idiots and imbeciles could not be dealt with in accordance with its requirements, and in their reports the Prison Commissioners often have recorded their inability to afford their defective criminals its benefits. By defining the degrees of mental defect as definite legal entities, by effecting thus an arbitrary classification of clinical conditions not always easy to realise in actual practice, by insisting that only such aments as appeared to be members of these statutory classes should be dealt with, and by requiring, in every instance, that certification shall precede treatment, this important measure unduly restricted the range of its usefulness and successfully frustrated the primary purpose of its initiation.

There was a hope that an amending Bill, valuing its opportunity, would endeavour to remedy these defects. That hope has not been fulfilled. Neither in the Bill of 1926, nor in Mr. Crompton Wood's measure, whose second reading is to be heard in the House of Commons on March 18th, is there any indication of even a recognition of the fundamental flaws of the principal Act. As these measures are the first to deal with mental conditions since the rising of the recent Royal Commission on Lunacy and Mental Disorder, it is to be regretted that as far as these two Bills are concerned it would seem

as if the principles underlying the most important of the recommendations of that Commission have never been accepted. Detention, such as is available for the dangerous paranoiac, is necessary also for the dangerous and criminal defective; certification, too, has its value in dealing with the neglected, the abandoned, and the cruelly treated; but it is unfortunate that these methods should be considered suitable also for the greater number of aments in need of institutional treatment who do not fall within these categories, for mentally defective children leaving school, and the helpless and harmless offspring of poor but well-intentioned and conscientious parents. The humane public is unwilling to look upon mental deficiency as a crime. They have got beyond such views. But if experts appear to maintain that the first requisite in dealing with this serious medical condition is the goodwill of a magistrate, the old impression is produced, with the unfortunate suggestion that no more hopeful ideals can be followed.

SUDDEN DEATH AMONG CONSCRIPTS.

SUDDEN deaths at the extremes of life when the subjects are very feeble or frail are not so uncommon as to cause surprise, but the sudden deaths of men in the army in peace time, men of military age, men accepted and retained as fit for service, these painfully surprise and shock their associates and their relatives, awaken suspicions of carelessness, and often cause the medical officers of the units concerned anxious searchings of heart. Each such case occurring in the French Army in a regiment, and not in hospital, is made the subject of a special report, and it occurred to Major X. M. Cristau that a discussion of the 145 of these reports received in the last seven years (1919-25) might be of use, and might even lessen their number in future. His paper appears in the *Archives de Médicine Militaires* (vol. lxxxv., p. 455). Cases of sudden death fall, he tells us, into four groups: first, those of patients in hospitals whose diseases develop unexpectedly; second, those of men whose complaints during life have been slight or vague; third, those of men who have made no complaint in life, but the cause of whose death is discovered at the post-mortem examination; and last, those of patients who made no complaint in life, and in whom examination of the body after death has failed to disclose a cause. Some of them (38) occurred in barrack infirmaries or when the men were thought so little ill that they had been left merely "on the sick list." Thus a patient had been a week under treatment for inflammation round an erupting wisdom tooth, and was recovering, when œdema of the larynx set in and he suddenly died. Ninety of the deaths happened when the men were on duty, on leave, or in their barrack-rooms asleep without disturbing the men beside them. Thus a Malagasy, on guard, did one tour of sentry-go but when he was being called for his next he was found to be dead (of double pneumonia); another of that unit died similarly, but in in his barrack-room, a week later. Such cases should be examined after death, but in 40 of those reported, autopsy was refused on account of religious scruple or objection on the part of relatives. Infectious fevers, either in the stage of invasion, or by complication, caused 31 deaths, 18 due to pneumonia, including 4 of acute œdema; typhoid caused 6, one fatal by hæmorrhage; meningitis 3, 2 being tuberculous, and of the malarial cases, 2 were due to rupture of the spleen. Cardiovascular lesions, apoplexy, embolism, ruptured aneurysm, accounted for 25; pleurisy, without or with adhesions, perhaps tuberculous, caused 22 (there is a special belief in France that pleuritic adhesions explain sudden death, though Dr. Cristau does not hold it); no cases are attributed directly to renal disease, but 7 to pulmonary œdema secondary to heart or kidney lesions; 5 are ascribed to alcohol, which brought vomited matter into the larynx. Five are attributed to primary inhibition of the heart. Dr. Cristau, who complains of the human tendency to give a definite diagnosis without absolute certainty, quotes the only case that he thinks must have been due to cardiac inhibition; it happened to a man who had never complained of illness, just as he had fired his rifle on the range. A very thorough post-mortem gave no other definite suggestion; all the organs were slightly enlarged, but with no definite change, only the heart was empty and dilated. In some cases it is difficult to state the cause of death exactly because there seem to be possibly two or more—e.g., pulmonary infarction with endocarditis; in others not even one probable cause can be found. A prisoner had complained vaguely of constipation and died at the latrine; except for a large sarcoma at the bifurcation of the abdominal aorta no lesion was found, nor was there any hæmorrhage. Of what, then, did this man die? That these cases of unexpected death may be the fewer, the author advises the careful examination of all persons who complain of even seemingly trivial illnesses. As we read his cases, it is clear that several would not have been seen in a voluntary army, for many men must be taken for service in a conscript army who would not be accepted as volunteers. It should also be noted that of 22 sudden deaths reported in detail eight were from native troops.

THE RETICULATED RED BLOOD CELL.

THAT certain of the red cells in human blood show peculiar filamentous structures when coloured in the fresh state by methylene-blue or any of the so-called vital stains has been recognised since the application of these staining methods to the blood by Ehrlich at the end of last century. It became apparent from the observations of various authors that the relative proportion of the reticulated to ordinary red cells varied according to the activity of the blood-forming organs. In the normal human subject, reticulated cells constitute about 1 per cent. of the whole number, but in such conditions as blood regeneration after hæmorrhage this proportion may be greatly increased. In fact, the reticulated red cell count probably offers the surest indication of the state of activity of the hæmatopoietic system at any given time. This being the case, it is somewhat surprising that the procedure does not at the present time occupy a more prominent place in the armamentarium of the clinical pathologist. Dr. Dameshek's recent publication [1] of routine reticulated red cell counts, undertaken in the Boston City Hospital, reveals their value as an index to the activity of the bone-marrow. In pernicious anæmia the reticulated cells usually form about 5 per cent. of the whole—a fact which accords with the generally accepted view that pernicious anæmia is essentially a regenerative anæmia. A rise in the percentage of reticulated cells was found to be inseparably associated with the approach of a remission, while the persistence of low percentage was of bad prognosis. In aplastic as opposed to pernicious anæmia, reticulated cells are almost absent, their proportion falling far below the normal of 1 per cent. Dr. Dameshek makes some observations upon the relationship of reticulated cells to platelets. He found that increase of platelets in the circulating blood is usually accompanied by an increased percentage of reticulated cells. In conditions such as the thrombopenias associated with splenomegaly, the principal clinical feature of which is purpura, he found that so long as the thrombopenia persisted the reticulated count was low. With remission of the thrombopenia, however, whether occurring in course of nature or after removal of the spleen, the reticulated count at once rose above normal. One result of his investigations was to bring to light a point in the differential diagnosis between Banti's disease and hereditary hæmolytic anæmia. In the former the reticulated count is either normal or not greatly increased; in the latter the

[1] The Reticulated Red Cells: Their Clinical Significance. Boston Medical and Surgical Journal, 1926, excv., p. 759.

percentage of reticulated cells seldom falls below 15 and is frequently in the neighbourhood of 50. In the words of the author, "a palpable spleen with a high (reticulated red cell) count equals either hæmolytic or pernicious anæmia, whereas a spleen with a normal or slightly raised count belongs to the Banti or cirrhosis group." The author's technique for the performance of the reticulated red cell count is simple. Brilliant cresyl blue, 0·3 per cent. in alcoholic solution, is used. Slides are kept on hand, having at one end a dried drop of dye. A drop of blood is placed on a cover-slip which is inverted on the dye, and the two are allowed to mix for from three to four minutes. The count is made with a high dry or oil-immersion objective and with an eyepiece furnished with a square diaphragm. One thousand red cells are counted and the proportion of reticulated cells noted.

ISAAC NEWTON.

IT will be 200 years to-morrow (Sunday) since the death of Isaac Newton, which occurred on March 20th, 1727. In a sense Newton's fundamental discoveries along the whole range of mathematics and the related physics had no immediate bearing upon medicine save in the realm of optics; nor, as we know from his life, had the phenomena of disease any attraction for him. But such profound revolutions of thought as were brought about by the publication of the "Principia" were bound to have an immediate and enlightening effect upon all medical and biological work. The machinery for research became facilitated, and, above all, the attitude in which discovery should be pursued became evident, with the result throughout Europe that pathology assumed a scientific status which it had never before attained, as the leaders of thought appreciated the significance of the new knowledge. The influence of Newton upon medicine was undoubtedly indirect, but medicine shared with all science the benefits derived from the grand enlightenment.

THE NATIONAL UNION OF SCIENTIFIC WORKERS.

THE National Union of Scientific Workers was founded in 1918 with the objects of promoting the cause of natural science in our national life and of improving the status of the scientific worker. It is entirely non-political and has definite economic and cultural aims. It has already been successful in securing improvements in the conditions of service of scientific workers in Government and private employ, and has intervened in a variety of matters in which the importance of scientific research has needed emphasis. The Union has, however, failed to incorporate more than a proportion of these who are qualified for admission; the membership is still less than a thousand, and in an attempt to extend its activities it has lately issued a general statement of its aims along with an invitation to workers to express their opinions on the question as to how the Union may best achieve its objects. The appeal is supported by a very weighty list of names distinguished in science and in public life. We do not doubt that such an organisation may be effective and sometimes useful, but we question whether those who are promoting it have sufficiently considered the psychology of the group mind, and have found a common ideal which will unite all the members they desire to attract into a corporate whole. "Scientific workers" have a common technique in so far as they proceed by experiment and mathematics. But their aims are by no means so similar, and it is at least doubtful whether their ideals are sufficiently homogeneous to form a bond of union between them which will stand more than the slightest strain. The British Medical Association promotes cultural and economic aims in the same way, and is successful because the members are all united by a real community of training and practice. We can imagine that many members of the National Union of Scientific Workers might band themselves together as university teachers. But it seems unlikely that they will easily and harmoniously run in double harness with those whose object in life is (or from their occupation ought to be) to earn dividends for shareholders in competitive chemical manufacture. Recent events to which THE LANCET has drawn attention bring out plainly the point over which disruption seems certain to come sooner or later; the Union is attempting to unite persons with ideals as different from each other as the ideals of those who would exploit medical discoveries for private gain are from those of the rest of the medical profession. One scientific worker has no necessary kinship with another scientific worker; it all depends on what ideal he is serving with the technique of scientific work.

AN INTERESTING COMMEMORATION.

A GATE in commemoration of the work of Sir Ronald Ross, erected near the north entry to the Presidency General Hospital, Calcutta, was opened on Jan. 7th by Lord Lytton, the Governor of Bengal. The memorial, which bears a medallion portrait of Sir Ronald Ross and an apposite inscription, faces one of the principal traffic routes of the city and will be passed by thousands of persons daily, who will thus be reminded that in a small laboratory a few yards from its site Ross's great discovery was made. Lord Lytton in an eloquent speech pointed out that Calcutta, although the birthplace of the knowledge had as yet derived less benefit from antimalarial work than other parts of the world, and instanced Panama, Ismailia, West Africa, and the Malay Peninsula as all owing freedom from malaria to the work they were assembled to commemorate. He welcomed Sir Ronald Ross on his visit to Calcutta with pride, and suggested that belated gratitude to him should take the form of an intensive campaign against malaria in Bengal. Sir Ronald Ross, in reply, associated himself with the labours of those who had preceded him in working out the problems, and described himself as living the proudest moment of his life. The commemoration ceremonies were organised by Colonel Megaw, head of the School of Tropical Medicine in Calcutta, who in an introductory speech spoke forcibly of the chilling atmosphere in which Ross's work had been done, of his dogged perseverance, and of the need of a tangible memorial seeing how general the ignorance was of what had been done.

STRIÆ PATELLARES.

THE condition of striæ patellares, of which Dr. J. D. Rolleston[1] recently showed an example at the section for the Study of Diseases in Children of the Royal Society of Medicine, is a localised form of that phenomenon which has received various names, such as striæ atrophicæ, striæ cutis distensæ, or striæ albicantes, and is called *vergetures* by the French and *falsche Narben* by the Germans. It is manifested by the appearance above the upper border of the patellæ of symmetrical transverse striæ, which at first are red or purplish in colour, and then gradually become pale, like the more familiar striæ atrophicæ associated with pregnancy. Though the condition has received considerable attention in France where it was first described by Regnier in his Paris thesis in 1860, as well as in Germany, not much has been written on the subject in this country, apart from articles by Dr. J. Bunch and Dr. F. Parkes Weber. It is met with after many infectious diseases, but is commonest after typhoid fever, as was exemplified in the patient, a girl aged 14, shown by Dr. Rolleston, who stated that he had seen another case following paratyphoid B. Bleibtreu in an article published in 1905, when typhoid fever was commoner than at present, relates how his chief, Prof. Leichtenstern, surprised his audience and the patient whose knee-jerks he was examining by saying that the man must

[1] Proceedings of the Royal Society of Medicine, February, 1927. Children's Section, p. 9.

have had an attack of typhoid fever in his youth. This retrospective diagnosis which recalls the methods of Sir Conan Doyle's hero turned out to be correct, having been suggested by the pale transverse striæ above the patellæ. Striæ patellares are probably of mechanical origin. The splitting or cleavage in the deeper layers of the cutis which gives rise to the phenomenon is due partly to rapid growth which is likely to occur after acute infectious diseases, and partly to the flexed attitude assumed by the patient lying in bed. Dr. Parkes Weber, however, in his discussion on Dr. Rolleston's patient, suggested as a further factor in many of these cases an abnormal trophic condition of the cutis which diminished its normal elastic distensibility and even increased the tension present in the skin of all normal young persons.

POST-VACCINAL ENCEPHALITIS.

NOT only a prophet but the outcome of the investigations of a government committee may be famed abroad, while unknown in the country of its origin. A correspondent gives on p. 619 an interesting survey of the world-literature of post-vaccinal encephalitis. Among the communications to which he draws attention is one made by Prof. Ricardo Jorge, director-general of Public Health in Portugal, to an international conference, held in May and June, 1926.[1] Dr. Jorge refers, in the course of an exhaustive discussion of the available evidence, to the report placed before the Comité de l'Office International d'Hygiène Publique at a previous meeting held at The Hague in May, 1925. This report apparently embodied the findings of a committee appointed *ad hoc* by the Ministry of Health of Great Britain under the chairmanship of Sir Frederick Andrewes. Dr. Jorge praises the report as an extremely abundant source of information, comprising systematic inquiries about cases, statistical analyses, topographical and chronological, research into ætiological and epidemiological relations, and finally a complete discussion of all imaginable hypotheses as to the nature of this encephalitis. From the data supplied he has compiled the following table:—

	No. of cases.	Years.
England	62	1922–24
Holland	36	1924–25
Switzerland	2	1924
Czecho-Slovakia	7	1923
Austria	1?	1924–25

Dr. Jorge says that "la commission Andrewes" considered, in turn, three questions: (1) whether the encephalitis is connected with the inoculation of vaccine in the direct relation of cause and effect, (2) whether, on the contrary, another known virus, such as that of poliomyelitis or encephalitis lethargica, has intervened, having found a portal of entry in the vaccination lesion, (3) whether some still unknown virus is the cause of the condition. According to him, each of these theories in turn was formally rejected by the commission, though it is difficult to see how they could all be wrong. He quotes with approval the following words of Prof. J. McIntosh, but gives no indication of their context: "I am strongly of the opinion that we have had to deal with a hitherto undescribed lesion of the central nervous system." In this connexion we may recall that in a paper published last August, Prof. H. M. Turnbull and Prof. McIntosh[2] published records of seven cases in which, they assert "there can be no doubt that vaccination was a definite causal factor." They describe the typical histological appearances of the lesions found, the most important characteristics being the number and size of zones of extra adventitial perivascular infiltration in comparison to the development and size of adventitial vascular sleeves; and the extensive distribution of the lesions. This elaborate study was published only after the report of "la commission Andrewes" had been handed to the International Conference at The Hague, but since Turnbull and McIntosh sent reports on the histological and experimental investigations described therein to the Ministry of Health in 1924, doubtless their findings received consideration. Meanwhile, in April, 1926, we were asked to give publicity to the formation of another committee, under the auspices of the Ministry of Health to investigate cases of encephalitis directly following vaccination, and practitioners were requested to inform its secretary, Dr. J. R. Hutchinson, of any cases which came under their observation. In view of the international importance of clearing up the ætiology of this form of encephalitis, it may be hoped that the report of this committee will not be long delayed.

[1] Office International d'Hygiène Publique. Bulletin Mensuel, tome xix., No. 1, January, 1927.

[2] See THE LANCET, 1926, ii., 504.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. B. Biggar is restored to the estabt.

Temp. Capt. M. Ferguson relinquishes his commn., and is granted the rank of Capt.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. A. G. Henderson to be Capt.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) G. L. Thornton, from R.A.M.C., to be Col. andto be A.D.M.S., 43rd (Wessex) Div. T.A., vice Col. A. B. Soltau, K.H.P., who vacates that appointment.

Capt. H. C. C. Hackney to be Maj.

Supernumerary for Service with the O.T.C.—Maj. W. J. A. Laird, Res. of Off., resigns his commn. in the T.A.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. O'S. Murphy to be Col.

Capts. H. Aung Khin and Malik Anup Singh to be Majs.

Capt. M. F. D. Graham resigns his commn.

ROYAL MEDICAL BENVOLENT FUND.

AT the last meeting of the Committee 38 cases were considered and £746 10*s.* voted to 36 applicants. The following is a summary of some of the cases relieved:—

L.R.C.P. & S., aged 63, who through illness has been unable to take up his locum work and is now in hospital. To meet his expenses an emergency grant of £5 was sent and a further sum of £40 voted.

M.R.C.S. Eng., aged 57, held an assistantship until taken ill in December last, and is now in a nursing home. Only assets £120 capital and about £50 worth of furniture. Fund sent 10 guineas and voted a further £40 payable in six instalments.

Widow, aged 67, of M.R.C.S. Eng. who died in 1914. Through failure of investments and the loss of a son who contributed to her support, has had to take a post as housekeeper. During the last two years has broken her arm, and twice broken her ankle. Has £62 from two pensions and £60 as housekeeper. Debts £20. Voted £10.

Daughter, aged 40, of M.B. Aberd. who died in 1906. Supported herself as a clerk until 1925 when she had a serious breakdown. Now entirely dependent on her sister, who is a bank clerk. Mother, who died in 1923, was a grantee of the Fund. Applicant asks for a temporary grant. £10 voted.

M.R.C.S. Eng., aged 66, married. Sons killed in the late war. Has suffered from ill-health for the past 15 years. Has an allowance of £120 from a sister and £27 from the Ministry of Pensions. House belongs to wife and the rates amount to £13 per annum. Debts £55. Voted £30.

Widow, aged 60, of M.R.C.S. Eng. who died in 1924. She is a trained nurse but delicate. Applicant let her house furnished but has had no rent for three months and has taken an action against the tenant for recovery. Has a pension of £50 a year and £8 10*s.* from children who are both married. Voted £26 in monthly instalments.

Daughter, aged 60, of M.R.C.S. Eng. who died in 1913. On account of age has had great difficulty in finding employment as a dispenser and last year only made £82. From investments received £24. Board and lodging £90. Voted £12 in 12 instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

Modern Technique in Treatment.

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CCXV.

TREATMENT OF ACHALASIA OF THE CARDIA (SO-CALLED "CARDIOSPASM").

I.*—General Considerations.

THE mouth of the œsophagus is closed during rest by the tonic contraction of the inferior constrictor of the pharynx. The lower end is closed by the cardiac sphincter. This is a definite structure from 1 to 1½ in. in length (Fig. 1); it constitutes the intra-abdominal

FIG. 1.

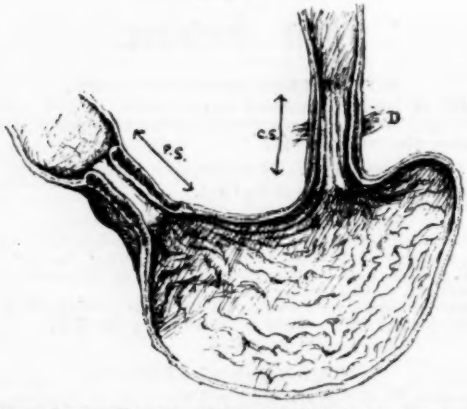
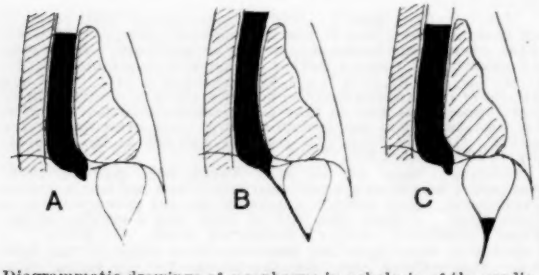


Diagram showing the stomach of a full-time fœtus. CS, cardiac sphincter, with deep, pale, longitudinal rugæ and thickened circular muscle. D, diaphragm attached to centre of sphincter. PS, pyloric sphincter.

portion of the œsophagus and may extend a short way above the diaphragm. Its muscular coat is very slightly thicker than that of the rest of the œsophagus, and its mucous membrane is thrown into longitudinal instead of transverse folds. The nerve-plexus of Auerbach between its muscular coats is well developed,

FIG. 3.

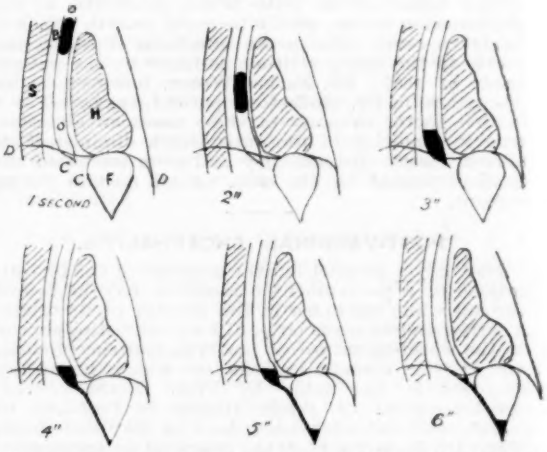


Diagrammatic drawings of œsophagus in achalasia of the cardia. A, shows column of barium-containing food, 8 in. high, above closed cardia. B, after additional quantity of food swallowed, so that the taller column, being heavier, opens cardia and allows surplus to enter stomach. C, Return to condition of (A) after surplus food over the 8 in. column has entered stomach.

forming a special "nodal tissue," similar in structure to the neuromuscular nodes of the heart.

Physiology.—In the process of swallowing food is thrust through the pharynx by the action of the tongue; the upper sphincter relaxes and permits it to enter the œsophagus, down which it is propelled by peristalsis. When a peristaltic wave passes down a muscular tube, the wave of contraction is preceded by a wave of relaxation; consequently when the diaphragm is reached the cardiac sphincter relaxes,

FIG. 2.



Diagrams of the passage of a bolus of barium-containing food (B) through the œsophagus (O-O), as seen with the X rays in successive seconds after swallowing. S, spine; H, heart; D D, diaphragm; C C, cardiac sphincter; F, fundus of stomach.

and the food passes through it into the stomach, after which the sphincter once more closes in order to prevent regurgitation into the mouth (Fig. 2).

Pathology.—Achalasia of the cardia is a condition in which the cardiac sphincter does not relax (α, not; χαλάω, relax) in the act of deglutition [1 2]; the food is retained in the lower end of the œsophagus, the peristalsis of which is not sufficiently strong to overcome the resistance offered by the closed sphincter. More and more food accumulates until a column 8 in.

FIG. 4.

Microphotograph of a normal ganglion of Auerbach's plexus in the lower end of the œsophagus. X 50. (G. W. Rake, Guy's Hospital Reports, vol. lxxvi., No. 2, 1926).

high is formed; the pressure exerted by this is just sufficient to overcome the resistance of the cardiac sphincter, so that any additional food now taken forces that in the lower end of the œsophagus through the sphincter, which closes again directly the height of the

* Part II., on Symptoms and Diagnosis and Measures for Relief, will be published next week.

[1] H. D. Rolleston: Trans. Path. Soc., 1896, xlvii., 37.
[2] A. F. Hurst: Quart. Jour. Med., 1914, viii., 300; and Medical Essays and Addresses, p. 110, London, 1924.

column of food falls below 8 in. (Fig. 3). Consequently the patient is able to obtain just sufficient nourishment to maintain a low level of nutrition, but the œsophagus is constantly full; food does not regurgitate from it even on lying down, as the upper sphincter

FIG. 5.

Microphotograph of ganglion showing cell infiltration and degeneration of ganglion cells in achalasia of the cardia. (G. W. Rake, Guy's Hospital Reports, vol. lxxvi., No. 2, 1926.)

is closed, except during deglutition, though by a voluntary effort the œsophagus can generally be emptied. The obstruction offered by the cardiac sphincter results in over-action of the œsophageal muscle, which becomes greatly hypertrophied, and the accumulation of food leads to enormous dilatation. The sphincter, however, remains unchanged, the

FIG. 6.

Section through cardiac end of œsophagus in Mr. Grey Turner's case of achalasia, to show cell infiltration (R), and fibrosis (F) of Auerbach's plexus, and complete disappearance of ganglion cells, none being seen in any of 50 serial sections. × 50. (Prof. Adrian Stokes.)

hypertrophy, which would be present were there an element of spasm, being never observed.

Achalasia of the cardia must be due to interference with the normal neuromuscular mechanism which leads to the relaxation of the cardiac sphincter on the arrival of each peristaltic wave. Occasionally this is the result of some organic disease involving the vagus, such as tabes or peripheral neuritis; occasionally it is reflex and secondary to irritation of the œsophagus by adhesions to a tuberculous gland, or to an ulcer or growth of the stomach. In the large majority of cases no obvious cause is found; the condition is then probably due to inflammation, degeneration, or syphilis involving the nerve-plexus of the sphincter, strictly analogous with the local diseases which give rise to heart-block. Since I suggested this possibility[2] three cases have been investigated pathologically at Guy's Hospital: in the first, Rake[3] demonstrated well-marked inflammatory and degenerative changes in the lower end of the œsophagus, particularly involving Auerbach's plexus (Figs. 4 and 5); in the second and third specimens, sent respectively by Mr. Grey Turner, of Newcastle-on-Tyne, and Mr. J. Morley, of Manchester, Prof. Adrian Stokes found that the whole of the nerve-plexus in the neighbourhood of the cardiac sphincter had been destroyed and was replaced by fibrous tissue (Fig. 6).

ARTHUR F. HURST, M.D. Oxf., F.R.C.P. Lond.,
Physician to Guy's Hospital.

(To be concluded.)

Special Articles.

ACUTE DISEASE OF THE CENTRAL NERVOUS SYSTEM ASSOCIATED WITH VACCINATION.

CASES of encephalitis following or occurring in the course of acute infectious diseases have been reported in the medical journals from time to time during the last few years. No doubt the severe epidemics of diseases of the central nervous system which have occurred in the last 20 years have made medical practitioners more alert in diagnosing and more exact in describing cases of meningitis, poliomyelitis, and encephalitis lethargica which formerly were regarded as rare or even unprecedented, except by the specialist in nervous diseases, and passed unexplained. Knowledge of these diseases and their differential diagnosis has been greatly improved by additions to clinical methods such as lumbar puncture and chemical, microscopic, and cultural examination of the cerebro-spinal fluid.

Cases of encephalitis or *meningitis serosa* in the course of measles and varicella have probably actually occurred more frequently and have certainly been more often recorded during the last five or six years. Winnicott and Gibbs[4] collected 12 cases of varicellar encephalitis. A recent review by E. Glanzmann[5] of the nervous complications of varicella, variola, and vaccinia, mentions five cases of encephalitis after chicken-pox. He also mentions 13 recorded cases of small-pox in which nervous complications, especially aphasia, appeared on dates fairly evenly distributed between the second and twenty-eighth day of the original disease. F. Lust (1926) recorded four cases following measles and mentioned nine recorded by others.

Encephalitis following Antivariolous Vaccination.

The subject has acquired additional interest and importance from the occurrence of a number of cases of encephalitis following antivariolous vaccination. General attention was first drawn to the subject in the medical press by F. Lucksch[6] in 1924. He described three fatal cases which he had observed in Bohemia in 1923, all of which were taken ill exactly ten days after vaccination. The vaccination itself had run a normal course without apparent excessive reaction.

[3] G. W. Rake: Guy's Hosp. Rep., 1926, lxxvi., 145.
[4] British Journal of Children's Diseases (1926, vol. xxiii.), referred to in THE LANCET, July 3rd, 1926.
[5] Schweiz. med. Wochenschr., Feb. 12th, 1927.
[6] Med. Klinik, 24, viii., 24, p. 1170.

Lucksch at first regarded these cases as typical cases of encephalitis lethargica on the grounds of clinical symptoms and of pathological anatomy and histology. Later, however, he was led to blame the vaccinia virus for the changes in the brain. Cases with similar symptoms and all suggesting acute intracranial inflammation have now been described from Holland, Austria, Switzerland, France, England, Greece, and Czecho-Slovakia. The earliest recorded case appears to have come under the observation of Comby in 1905 and to have been recorded with two others in 1907. Comby refers to these and narrates an additional and recent fatal case.[7] Prof. R. Jorge [8] recently reviewed all the evidence concerning post-vaccination encephalitis, and gave the numbers recorded in different countries: England, 62; Holland, 36; Switzerland, 2; Czecho-Slovakia, 7; and Austria, 1. He also discusses the report of the committee appointed by the Ministry of Health to investigate the subject, which has not yet been published in this country. Five fatal cases of post-vaccinal encephalitis occurring in this country which closely resembled those reported from the continent were recorded by Turnbull and McIntosh,[9] and G. van Rijnberk [10] states that 62 such cases with a 56 per cent. mortality have occurred in England. A Departmental Committee on Vaccination has been appointed by the Ministry of Health, and on April 24th, 1926, an invitation to the medical profession was published in THE LANCET and *British Medical Journal* to send information to this committee of any cases of disease of the central nervous system arising within four weeks of vaccination. No doubt the committee will report in due course, but so far no information on the subject has been published.

Though not all have had quite the same history and symptoms the majority have been alike in certain particulars and especially in the time of onset of the acute cerebral condition which has been in most cases 8 to 12 days after vaccination. The symptoms have indicated acute encephalitis, but without, as a rule, evidence of meningitis. Permanent local paralysis, which is so characteristic of acute poliomyelitis and other lasting sequelæ common after encephalitis lethargica, are almost absent from the records.

The largest series of cases reported from any one country was observed in Holland. This has been fully discussed by F. S. B. v. Bastiaanse, P. Bijl, and J. Th. Terburgh.[11] These writers state that 35 cases occurred between Jan. 1st, 1924, and the end of June, 1925, whilst about 250,000 children were vaccinated in the same period. Thirty-three of the cases were in children of 3 to 6 years, and at these ages 79,936 children were vaccinated during 1924 alone, out of a total of 161,145 vaccinations under 13 years of age. The proportion of vaccinated children attacked was therefore very small and selection of a special age by the disease very definite.

The period which elapsed between vaccination and the acute onset of encephalitis was 5 to 23 days. Usually the first symptoms occurred on the tenth to the twelfth day (24 cases). Vomiting, headache, and high fever followed by drowsiness and convulsions were the chief symptoms. The acute stage lasted 7 to 15 days and 15 of the children died (42 per cent.). There was a notable absence of sequelæ in those that recovered. During February, March, and April, 1925, about 122,000 persons were vaccinated and 24 cases of post-vaccinal encephalitis occurred—i.e., 1 in 5000—but during the other nine months of that year with 151,000 vaccinations there were only 7 cases, or 1 in about 21,400 vaccinations. The large area of Europe involved and the many different sources from which the vaccine implicated came negatived the idea that the disease could be due to contaminated vaccine, and the large number of children who were vaccinated with the same lymph and escaped complications pointed in the same direction. The vaccine used in Holland came from 12 different calves which had been inoculated with five different strains of lymph, two from Holland, two German, and one from the East Indies. Bastianse attributed his cases to infection with encephalitis lethargica which at that time was very prevalent. The figures which he gives for the first months of 1925 strongly support this view.

In January there were 12 cases of encephalitis notified.					
In February	16	cases,	of which	2	were post-vaccination cases.
In March	51	,,	,,	16	,, ,,
In April	27	,,	,,	7	,, ,,
In May	10	,,	,,	0	,, ,,

The increased number of vaccinations performed during the same period also suggested that the post-vaccination cases might be due to chance vaccination of children already infected with encephalitis lethargica.

The Nature of the Disease.

Bastianse recognised that the cases did not conform exactly to the usual type of encephalitis lethargica, since the onset was more sudden, the occurrence of paralyses very much rarer, and the mortality much higher, especially for children.

The symptomatology of Economo's encephalitis is, however, notoriously varied, and there is also a tendency for the symptoms and the type of the disease to be slightly different in one country or in one group of cases to that occurring elsewhere. A similar variability is also found in the cases of post-vaccination encephalitis—e.g., the trismus- and tetanus-like symptoms which occurred in Lucksch's cases. Against the view that the essential cause of encephalitis is the vaccinia virus must be placed the almost invariable failure to detect this in the central nervous system of the children who have died and been examined post mortem. The paper by Turnbull and McIntosh appears to contain the only published evidence of vaccinia virus being recovered from the brain or lumbar-puncture fluid of patients. It is well known, however, that after the inoculation of rabbits with vaccinia on the skin the virus can be found in almost every organ, including the brain, for two or three weeks, if the search is thoroughly carried out, even though the lesions are confined to the skin.

The question of the exact nature of these cases of post-vaccinal encephalitis occurring in so many countries and the share which vaccinia and other causes have in their production is not as yet determined. Among all the writers who have reported cases or reviewed the subject there is general agreement that vaccination has some causal relationship to the cases, although they are relatively rare, about 1 to 1·4 in 10,000 vaccinations in Holland and Switzerland. That the disease is simply vaccinal inflammation of the brain, as suggested by Turnbull and McIntosh, Lucksch, and others, and that it is perhaps due to an especially neurotropic strain of vaccinia appears to be negatived by the following considerations.

1. Enormous numbers of children have been vaccinated in the past without cases of encephalitis resulting, at any rate, in numbers approximating to the present series, till quite recent years, and a large number of innocuous contemporary vaccinations are carried out.

2. Except in one case there has been failure to detect any evidence of vaccinia virus in the brain of fatal cases, either experimentally by the inoculation of rabbits or serologically by the method of Kraus and Takaki. Even if found its presence would not have the significance implied by Lucksch and Kraus, since its wide distribution in the body is believed to invariably follow vaccination.

3. Large numbers of children have been vaccinated with the same strains of lymph which were used for those who subsequently became ill, and many

[7] Bulletin et Mém. d. la Soc. des Hôpitaux de Paris, Oct. 8th, 1926.
[8] Bulletin Mensuel de l'Office International d'Hygiène Publique, January, 1927.
[9] British Journal of Experimental Pathology, August, 1926.
[10] Nederland. Tijdschrift v. Geneeskunde, Sept. 18th, 1926.
[11] Bulletin de l'Académie de Médecine, Sept. 21st, 1925, and more fully in the Nederland. Tijdschrift v. Geneeskunde, Sept. 18th, 1926, p. 1267.

thousands of children have been vaccinated without bad results with Levaditi's "neurovaccine" which had been repeatedly passaged through the brain of rabbits.

4. The suggestion that on the average about 1 in 10,000 of all vaccinations is followed by encephalitis is scarcely compatible with the special incidence in certain countries and parts of a country. Bastianse found strong evidence of factors connected with time and place which determined the incidence of cases. In two large towns of over 100,000 inhabitants each there was one case in 30,000 of the population and 1 in 9000 of vaccinations. In towns of under 5000 inhabitants there was 1 in 2000 of the population and 1 in every 63 vaccinated.

5. The special histological peculiarities of the post-vaccination encephalitis described by Turnbull and McIntosh are not universally accepted, and the great variability of the pathological anatomy and histology in encephalitis lethargica make exclusion of this disease difficult on these grounds.

6. The clinical features in some cases strongly suggest encephalitis lethargica, and, in any case, are not sufficiently uniform to constitute the definite syndrome of a new and distinct disease.

In favour of the view of Bastianse, Levaditi, Kraus, Zurukzoglu, and others that the post-vaccination encephalitis is Economo's disease with vaccination acting as an exciting and modifying cause in persons incubating or carrying the virus of the former, are: (1) The general morbid anatomy and clinical history. (2) The great prevalence of the disease during the last few years, which in some instances has been especially accentuated in the time and in the country where the cases of post-vaccination encephalitis have occurred. (3) Kraus and Takaki, by a special technique which had been worked out with herpes virus and serum from lethargica patients, obtained fixation of complement with the central nervous system of fatal cases as "antigen" and serum from cases of encephalitis lethargica, but not with serum immune to vaccinia. (4) Experiments in which herpes virus inoculated subcutaneously in rabbits has caused encephalitis when vaccinia has also been injected intravenously at the same time have been brought forward by Zurukzoglu as evidence that vaccinia produces a susceptibility of the brain to herpes or other encephalitic virus.

The experimental evidence brought forward in support of these views by Kraus and Takaki and by Zurukzoglu involves the acceptance of the identity of the virus of herpes encephalitis and that of encephalitis lethargica. This identity is not generally accepted, though supported by Levaditi and Perdrau. Most experimenters have completely failed to infect animals with lethargic virus, and such successes as have occurred are widely held to be due to concomitant infection of the patient or the rabbit with herpes virus.

Conclusion.

Between the views which attribute the actual encephalitis to vaccinia and to encephalitis lethargica or herpes virus respectively are a number of grades of opinion according to which endemics and epidemics of such diseases as Economo's encephalitis, poliomyelitis, and even cerebro-spinal meningitis are taken as evidence of a general predisposition to disease of the central nervous system and vaccination as an exciting, predisposing, or merely additional factor. These views and their possible modifications have been ably discussed by Sobernheim.

The only possible conclusions to be drawn with certainty are that the cases of post-vaccinal encephalitis do result from vaccination at least as a contributory cause, but that the immediate cause of the encephalitis is probably not an ordinary bacterial infection, but some living ultravisible virus. To the question what is the exact nature of this virus the answer is less sure, but the evidence points decidedly against the vaccinia virus acting alone, and there is a further probability that virus of encephalitis or possibly that of poliomyelitis has an important share in the production of the cases of disease. Which of these viruses is active in a given case may depend on the prevailing epidemic or season. In either case the course of the disease and character of the symptoms may not improbably be modified by the vaccinal infection. Since encephalitis lethargica has not so far been certainly communicated to animals, unless the virus of herpes is eventually shown to be a form of the same infective agent, experimental failure to infect rabbits or monkeys from post-vaccination cases of encephalitis does not help to decide whether that virus is playing an active part.

MEDICINE AND THE LAW.

The Position of the Medical Witness.

A CASE of some interest came lately before the Banbury County Court. Dr. Alan Forty, of Shenington, made a claim for 10*s*. 6*d*. because of the principle involved, namely, the right of the medical man to be paid for a medical report affording help in the course of legal procedure which could not be classed as the ordinary help which a member of the public would be able to give at the request of the police. The facts are these. Dr. Forty received a message that two men had been injured in the overturning of a motor car. He found a constable in charge, examined the driver of the car and formed the opinion that he was not under the influence of drink. The following day the constable asked him to make a report with reference to the condition of the driver, which was done, the report in writing being accompanied by an account for 10*s*. 6*d*. In reply Dr. Forty received an intimation that his claim was not understood, inasmuch as he had supplied only the help which it would have been the duty of any other person to render to the police. A claim was then brought by the London and Counties Medical Protection Society for Dr. Forty against the Chief Constable of the County, who said in court that payment was opposed as being a matter of concern to the ratepayers. Judge Staveley Hill said that the case was interesting, though the amount involved was small. He held that the plaintiff had not substantiated his claim, as he was not called in by the police. He did not consider that the writing of a report later made the assistance which Dr. Forty had rendered to the police any different from that which might have been given by an ordinary witness. He gave judgment for the defendant, but without costs. It is clear that His Honour recognised that Dr. Forty's claim was made on principle, and that the Chief Constable of the County had opposed payment for the same reason. The matter cannot apparently be carried further, as an appeal would probably not be allowed, because it would be founded on a question of fact, and not on a point of law; but to medical men the decision of Judge Staveley Hill will not appear satisfactory. The assistance that was given by Dr. Forty to the constable in charge of the case was distinctly of medical or expert nature. An investigation of the condition of the driver might have had considerable bearing on the sequel, when the medical qualifications of a witness would have been all important. No layman who happened to be on the scene of the accident would have been able to give the authoritative assistance that could be rendered by a doctor.

ST. LUKE'S HOSPITAL.—The Governors of St. Luke's Hospital have acquired three houses, standing together in eight acres in Woodside Avenue, Muswell Hill. Further buildings are to be erected and it is intended to use the whole establishment as a nursing home for nervous cases and for clinical purposes.

A HOSPITAL AMALGAMATION.—It has been decided to amalgamate the Plymouth Ear and Throat Hospital with the South Devon and East Cornwall Hospital. On the other hand, the Governors of the Bristol Royal Hospital for Sick Children have rejected a proposal to work in conjunction with the Royal Infirmary.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Influenza.

FROM the returns collected and circulated by the League of Nations Health Section, it is clear that the endemic prevalence of influenza in Scotland has been reinforced by fresh infection from various countries. Influenza has wandered into almost every part of Scotland. Thus there are localities in the Lowlands where a couple of families imported from England have spread influenza through a village or region, and it is this type of sudden invasion and spread that confirms a diagnosis of specificity. Early in the year there was little evidence of a widespread epidemic, and even a doubt of the real nature of the disease. Seasonal colds and catarrhs necessarily complicated the position. But, even in special areas like Edinburgh or Glasgow, the characteristic syndrome of influenza—including headache, pains in the back, slight cough, laryngitis, or gastric symptoms—were repeated too often be ignored. The epidemic was reminiscent of that of 1890, but it is the universal story that the cases are mild. This, of course, is one of the treacherous features of influenza; it is most likely that there will be a group of cardiac or other disablements later in the year.

No doubt, the Health Section of the League of Nations will arrange for a general report to be built up on the basis of local reports, and this ought to throw light on the European spread of the infection. It may bring together data bearing on the two problems, (*a*) why the endemic infection persists, though in an ever-weakening form, and (*b*) why, in spite of the immunity to be expected from this wide diffusion, a more virulent infection suddenly stirs up fresh epidemics.

Meanwhile, how is the death rate affected? The following figures are taken from the weekly returns for the 16 large towns. In 1925 there was a steady increase of deaths from influenza until the fourth week of March, when the climax was 97 per week. In 1926, the numbers were relatively low until the third week of March, when they rose from 12 to 31, and by the second week of April had reached 115. By the end of May, the numbers were down to 6. In 1927, the weekly deaths have been rather more than in 1925 or 1926. They show an increase towards the end of January from 13 to 18, and in February they have worked up from 24 at the beginning to 45 at the end. In the first week of March there were 62 deaths. The period of heaviest incidence seems to have shifted to a later period than last year, and 1927 may repeat the incidence of 1925.

Treatment of Cripples.

Both in Glasgow and Edinburgh active steps are being taken to improve the treatment of cripples. Recently Glasgow established an orthopædic clinic. In Edinburgh, the movement for establishing a hospital for cripples is very active, and the promoters have every hope of a cordial response to the appeal when it is launched. This hospital will be an important new departure in many respects. The policy of a distinct hospital has been adopted after careful discussion with the leading hospital authorities in Edinburgh. The minimum aimed at is 75 beds and the estimated cost about £75,000.

Pneumonia in Glasgow.

Dr. A. S. M. MacGregor says that pneumonia in Glasgow was slightly more prevalent in January than in December, and that its treatment formed a large part of the work in the hospitals. The municipal care of pneumonia remains on the high level set a few years ago. The severity of the disease was roughly normal, the case-mortality being 30·8 per cent.

Careful observations of air pollution by smoke and the local incidence of fogs are still being taken, and it is hoped that definite correlations may be established between respiratory epidemics and the proportion of soot and fogs. Over a generation ago the late Dr. Burn Russell indicated that a day would come when health measures could do no more for the environment, and when Glasgow would suffer from its ultimate disability—namely, the fact that it is a large crowded city lying mainly in a flat and chilly river valley. Perhaps that day may come; but meanwhile there is a lot to do to get the Glasgow air clearer. Dr. Russell would probably have thought many times before devoting hundreds of beds to the municipal treatment of pneumonia.

The Lister Centenary.

The official programme of the celebrations to be held in Glasgow on April 1st has now been issued. They will begin with a service in the Cathedral at 11.15 A.M., which will be attended by the Lord Provost and magistrates, and representatives of the University, the Royal Faculty of Physicians and Surgeons, and other public and scientific bodies. There will previously be a procession from the Royal Infirmary to the cathedral. The Rev. Lauchlan MacLean Watt, Minister of Glasgow, will preach the sermon, and afterwards the Lord Provost and corporation will give a luncheon in the City Chambers. The toast of the Illustrious Memory of Lord Lister will be proposed by Sir John Bland-Sutton, and at the conclusion of the luncheon those who wish to honour Lister's memory by placing flowers on his statue will proceed to the Kelvingrove Park for the purpose, leaving the City Chambers about 3 o'clock. The University of Glasgow will give a reception at 8 P.M. The guests will be received by the Principal who will, during the evening, deliver an address of welcome. Short addresses will also be delivered by Sir Hector Cameron, Sir George Beatson, Prof. Murdoch Cameron, and Prof. Irving Cameron of Toronto.

In connexion with the centenary, Messrs. Jackson, Wylie and Co., will publish this month a book by Sir Hector Cameron, entitled "Reminiscences of Lister and of his Work in the Wards of the Glasgow Royal Infirmary, 1860–69," and also "Lister and the Lister Ward in the Royal Infirmary of Glasgow," by Mr. Ernest Maylard., F.R.F.P.S, Mr. James A. Morris, F.R.I.B.A., and Mr. L. W. G. Malcolm, M.Sc., with an introduction by Lord Blythswood.

Lectures and Meetings.

This year two distinguished lecturers have visited Scotland—Prof. A. S. Eddington and Prof. J. S. Haldane. When Prof. Haldane's Gifford lectures are reprinted, we shall have a full and critical statement of the guiding value of the concept of vitalism, an idea which has great significance in medicine. In the flux of physical and physiological ideas, as expounded by Eddington and Haldane respectively, there is a danger that both biology and physiology may glide into the older world where *virtus dormitiva* could, without shame, be regarded as an explanation. Prof. Haldane is in no such danger, but the possibility nevertheless exists.

Among other lectures recently given has been a series on the Problem of Maternal Morbidity arranged by the Edinburgh Women Citizens, and delivered by Dr. Charlotte A. Douglas, Prof. R. W. Johnstone, Dr. Mary Macnicol, Dr. Margaret Martin, and Dr. W. T. Benson. The last of them is to be given by Prof. Munro Kerr on Maternity as it Should Be. As a form of public education in health, nothing could be better than these lectures, and there is evidence of growing interest in the problems of maternity, which are to be the subject of discussion this year at the Annual Meeting at Rothesay of the Scottish Association of Health Visitors, Women Sanitary Inspectors and School Nurses. This conference also will be addressed by Prof. Kerr and Prof. Johnstone.

RESIGNATION OF AN HONORARY SURGEON.—Mr. H. J. Godwin has resigned the position of honorary surgeon of the Hampshire County Hospital, which he has held for 23 years. The annual Court of Governors has passed a resolution of thanks and regret.

A PORTRAIT OF WILLIAM HARVEY.

Observations and Notes by

RICKARD W. LLOYD, M.R.C.S. ENG., L.R.C.P. EDIN.

"There thy Observing Eye first found the Art
Of all the Wheels and Clock-work of the Heart:
The mystic causes of its Dark Estate,
What Pullies Close its Cells, and what Dilate.
What secret Engines tune the Pulse, whose din
By Chimes without, Strikes how things fare within."
—M. LL., M.D.[1]

THIS old picture bears as its title "GULIELMUS HARVEUS, Anno Dom. 1647": the words are placed to the left of the face in the background, removing all doubt who is the subject of the portrait. The question arises, was the picture painted by Lely? Among the *intrinsic* evidences in support of that are, in my opinion, the drawing, colour, and handling of the work; there is also the signature "P. Lely" towards the right on the lower rim of the inkstand.

Information upon the portrait and any *extrinsic* evidences of attribution would be very much appreciated by me. The portrait is on an oak panel 12 inches by 10 inches. There is a portrait of William Harvey by Cornelis Janssens in the Royal College of Physicians of London, where he was Professor of Anatomy and Chirurgery, and another from an unknown hand in the National Portrait Gallery.

A PORTRAIT OF WILLIAM HARVEY.

The artist has dwelt upon Harvey's acts and meditations and renders his impressions of the theme. Harvey is portrayed with long grey hair which may well have been dark when he was younger in accordance with tradition; of thoughtful expression, of short stature, and easy graceful mien. He is wearing a gown—perhaps the identical one bequeathed by him as "my velvet gowne to my lovinge friend Dr. Scarburgh"—over a dress of a gentleman of the time; and standing, nearly vis-à-vis, delivering a lecture. His left hand is supporting a skull; while his right is resting upon a diagram of the circulation of the blood, which he had first publicly demonstrated in a lecture, delivered on April 17th, 1616, on the Chest and its Contents.

In 1647, the date which the picture bears, Harvey was about 69 years of age; he died 10 years later, in 1657. In 1646, after the surrender of Oxford during the Rebellion, Harvey returned to London and resided at his brothers' houses. They were wealthy merchants. There would seem nothing improbable in Harvey giving sittings to Sir Peter Lely. Lely was born 1618, arrived in England in 1641, and in 1643, at the age of 25, painted portraits of Charles I., William, Prince of Orange, and Princess Mary. We learn also from Bryan's dictionary that among the very numerous portraits which he painted was one of Oliver Cromwell. At the Restoration, Charles II. appointed Lely his principal painter, and created him a baronet in 1679 or 1680. Lely was seized with apoplexy while engaged on a portrait of the Duchess of Somerset, and died in 1680.

A signature is not needed to prove a picture to be genuine, even where the artist's habit was to sign. A signature may be a good clue to ascription; an original signature is, of course, strong evidence of authorship, while even a false or faked signature is not definite proof against authorship, for a signature may be added to a genuine picture.

The small photograph which accompanies these notes does no justice to the original, which I shall be happy to show to persons interested.

[1] Extracts from a poem to the Incomparable Dr. Harvey on his Books of the Motion of the Heart and Blood, &c. The poem appeared as an introductory in Anatomical Exercitations, 1653, and is signed M. LL., M.D.

ROYAL FREE HOSPITAL: NEW CHILDREN'S WARDS. The Queen opened recently the new Riddell Wards for children, so named after Lord Riddell, the president of the hospital. Advantage has been taken of the position at the top of the building to provide facilities for sunlight treatment. Eighteen beds are available, and boys will be admitted up to 10 years of age, and girls up to 12. The centenary of the hospital is to be celebrated by erecting a children's wing, to include quarters for infants' and children's clinics, a tonsil and adenoid ward, an operating theatre, and recovery rooms, and an expansion of the pathological department. The cost will be £200,000.

Obituary.

FREDERICK ARMITAGE SOUTHAM,

M.A. OXF., F.R.C.S. ENG.,

EMERITUS PROFESSOR OF SURGERY IN MANCHESTER UNIVERSITY.

THE death of Mr. F. A. Southam on March 9th removes one of the greatest clinical teachers that the Manchester school has yet produced as well as one of the soundest and most brilliant of operating surgeons.

Frederick Southam was the son of George Southam, honorary surgeon to the Manchester Royal Infirmary from 1847 to 1876, and connected also with the Royal School of Medicine in Pine-street. He was educated at Rugby and Christchurch, Oxford, where he took a first-class in Natural Science, proceeding to Manchester for his medical training and qualifying in 1876. After holding various junior appointments to the Royal Infirmary, he was elected honorary assistant surgeon in 1880, serving on the surgical staff until his retirement in 1910 at the age of 60. On the outbreak of war in 1914 he was mobilised as Lieutenant-Colonel in the 2nd Western General Hospital, and again took charge of the surgical unit at the infirmary, in order to release Colonel J. W. Smith to command this hospital.

[*Lafayette, Manchester.*

MR. F. A. SOUTHAM.

Mr. Southam's memory will be cherished by many generations of students who went round the wards of the Royal Infirmary with him; here his enthusiastic interest in his subject and the careful preparations made to illustrate its every aspect compelled the close attention of the whole class. His teaching was delightfully clear and concise and yet sufficiently dogmatic and definite to be easily remembered. However foolish an answer a student gave he never showed the slightest impatience, but would proceed quietly to criticise it in detail. He held strong and decided views on most surgical subjects, and usually insisted on following his own judgment, which had a way of proving remarkably accurate. As an operator he was not only brilliant and dexterous but he remained very cool and calm during the performance of the most extensive operative procedures, and it was always, writes one of his colleagues, a great surgical treat to watch him amputate at the hip by the Furneaux-Jordan method without a tourniquet. He was not, perhaps, as scrupulous as some in arresting hæmorrhage, and "a little oozing" was one of his common expressions—so much so that the students were wont to say that he would make use of this expression were he to cut the aorta itself.

He held many other appointments outside the infirmary, being attached to the Christie Hospital, the Cancer Pavilion and Home, the Northern Hospital for Women and Children, and the Jewish Hospital. For many years he occupied the chair of clinical surgery in the University, and he examined in surgery both at Manchester and Oxford. His private practice became very engrossing, but he never allowed it to interfere with his hospital duties. From his earliest years Mr. Southam was especially interested in the surgery of the bladder and urethra; he contributed an article on "Injuries and Diseases of the Bladder" to the Medical Encyclopædia, an Analysis of 120 operations for Vesical Calculi, and he received honourable mention for a Jacksonian Prize dissertation on Tumours of the Bladder. He was the author of "Regional Surgery, a Manual for Students," and his article on "Fractures" in Treves's "Manual of Surgery," was regarded as the best description of fractures available at that time. He was the first surgeon in Manchester to stand up for the interval operation in appendicitis, then being advocated by Treves.

Mr. Southam was of an intensely shy disposition. It used to be said of him that whenever he met a student coming down the street he would, if possible, avoid meeting him, but, if not possible, he would keep his eyes downcast until just the moment of passing when he would raise them with a quiet smile. Though small in stature he had an impressive personality, and was respected as well as beloved by his students and colleagues who elected him at one time or another to the presidency of all the local medical and pathological societies. An old Oxford Blue in sprint racing, he kept up his interest in athletics as far as his time permitted. His wife predeceased him by some years. He leaves two sons, the elder of whom is vicar of St. Mark's, Portsmouth, the younger, with whom he lived, being Mr. A. H. Southam, a Hunterian lecturer at the Royal College of Surgeons of England this year.

THE LATE DR. SHILLINGTON SCALES.

Dr. Stanley Melville sends the following appreciation of Dr. Shillington Scales, an obituary notice of whom appeared in THE LANCET of March 12th.

"The ever-thinning line of veterans in the field of radiology is the poorer by the passing of Francis Shillington Scales. To those of us who were associated with him in training candidates for the diploma, in serving on the Special Committee at Cambridge, or in conducting the examinations, the zeal and tireless enthusiasm of the man were revealed. He took no narrow academic view of the training, and to his lasting credit was his insistence upon wide clinical experience for the radiologist. For this reason he kept in close touch with the Education Committee of the British Institute of Radiology in London and with the great provincial medical schools. A man with a less wide outlook might have been tempted to confine the teaching to Cambridge itself, with the result that there would have been by now a multiplicity of diploma-conferring bodies in existence. As it was Shillington Scales always viewed with concern anything that was likely to upset the very happy relationship that had existed from the beginning with the teachers in the metropolitan schools and with great universities, such as Manchester and Liverpool. Shillington Scales was an excellent pathologist and microscopist, and he had the gift of being able to impart his knowledge to others. It was always noted that the men who came to London for the final two months' clinical training had a sound knowledge of pathology. He was a man of orderly mind and habit, and his system of filing and indexing was of inestimable value to him in preparing his lectures and to the *Journal of Radiology* for which he undertook to supply references to the literature. Shillington Scales's post will in due course be filled, and no doubt adequately filled, but he himself will be sadly missed by many friends who had learnt to appreciate him for his kindly personality and his selfless enthusiasm in working for an ideal."

Correspondence.

"Audi alteram partem."

FEES FOR PATHOLOGICAL INVESTIGATION.

To the Editor of THE LANCET.

SIR,—The British Pathologists Association was formed at a meeting held in London on Jan. 7th last for the purpose of developing the application of pathology in relation to medicine and of protecting the interests of those engaged in its study and practice. Membership is open to all registered medical practitioners engaged in the study and practice of pathology. It is in the opinion of the Council of the Association very necessary that there should be in existence a schedule of minimal fees payable for pathological investigations for persons insured under the National Health Insurance Acts. In the absence of such a schedule there is bound to be competition for this work with consequent fee-cutting and inefficient work.

The Council of the Association has in hand the drafting of a schedule of fees for the various classes of laboratory investigations in general use in clinical medicine. The fees in this schedule have been worked out on the basis of the cost per pair of hands per hour employed in a pathological laboratory under the direction of one of the members of the Association, where the costs have been accurately controlled over a period of years. The fees indicated may be regarded as the minima which can be expected to give a reasonable financial return when the procedures are performed in a laboratory subsidised from no outside source. Copies of this schedule will be sent on request to all members of the Association for comment or suggested amendment. It is proposed to submit this schedule to the Ministry of Health and to urge its adoption for pathological work performed for insured persons under any arrangements made either by the Ministry or by individual National Health Insurance Committees.

The British Pathologists Association is working in the very closest touch with the British Medical Association from which it has received invaluable help. The schedule of fees for pathological investigations is to be submitted to the Insurance Acts Committee of the British Medical Association at an early date, at a meeting at which the whole question of provision of a pathological service for panel patients will come under discussion.

In approaching the Ministry of Health the British Pathologists Association wishes to be able to speak as representing the body of practising pathologists in this country. Practising pathologists not already members of the Association are therefore urged to become so. The annual subscription is £1 1*s*., which includes entrance fee. Medical practitioners desiring to join the Association should communicate with one of the members of the Council, which is constituted as follows: Dr. C. Powell White (President), Victoria University, Manchester; Dr. J. G. Greenfield, National Hospital, Queen-square, London, W.C. 1; Dr. S. C. Dyke, Wolverhampton and Staffordshire Hospital, Wolverhampton; Dr. A. Renshaw, 16, St. John-street, Manchester; Dr. E. Wordley, South Devon and East Cornwall Hospital, Plymouth; Dr. G. Hadfield, General Hospital, Bristol; Dr A. G. Shera, Princess Alice Memorial Hospital, Eastbourne; Dr A. F. S. Sladden, General Hospital, Swansea; Dr. W. Grace, Royal Infirmary, Chester; Dr. R. V. Solly, Royal Devon and Exeter Hospital, Exeter.

I am, Sir, yours faithfully,

S. C. DYKE,
Secretary, British Pathologists Association.

Wolverhampton, March 10th, 1927.

LEAD-SELENIUM COLLOID IN CANCER.

To the Editor of THE LANCET.

SIR,—I have been interested in the brief account by Dr. A. T. Todd of the initial results obtained in some of the cases of malignant disease treated by him with "Lead-Selenium Colloid" (THE LANCET, March 12th, p. 575). The possibilities of a combination of these elements occurred to me, and doubtless to many others, long ago; and, as a matter of fact, our physical chemists had no difficulty in making an excellent colloid of lead selenide. But what will ultimately prove to be the most useful preparation of lead no one can foretell at the present time. Since many preparations of lead will probably be found to affect to a greater or lesser degree malignant neoplasms, what are really needed are comparative studies in regard to a large number of combinations rather than isolated observations of one particular preparation. This is the line our own clinical investigations have taken.

I am, Sir, yours faithfully,

Liverpool, March 12th, 1927. W. BLAIR BELL.

THE TREATMENT OF HERNIA.

To the Editor of THE LANCET.

SIR,—May I make the following observations in reply to the questions raised on the subject of the treatment of hernia by Mr. Geoffrey Keynes and Mr. T. P. Dunhill.[1] Although I have performed herniоplasty in children and healthy muscular adults, I do not consider it absolutely indicated in these cases of the oblique inguinal variety. I am of opinion, however, that employment of this method shortens the convalescence and will enable the patient to undertake strong muscular exertion at an earlier date than otherwise. In the case of both direct and femoral hernias hernioplasty should always be done.

I have performed my flap hernioplasty in many patients over 50, with feeble muscles, and suffering from large oblique hernias. Such patients belong to the class of case often refused operation by the surgeon. Here hernioplasty is strongly indicated and will give most satisfactory results.

As regards the second point also raised by Mr. Dunhill, I am still of the opinion that Gallie and Lemesurier's technique, if accurately followed, may be improved upon, as by my method. The use of stay knots and the method of joining sutures by perforating the previous strip is a complicated process and takes longer than the modification by means of the thread fixation stitch.

I am, Sir, yours faithfully,

London, March 14th, 1927. ERNEST COWELL.

RHEUMATISM AND MALNUTRITION.

To the Editor of THE LANCET.

SIR,—I have read with much interest your summary of the Report on Heart Disease, together with the leading article upon it, and I am delighted to find therein corroboration of what I stated at the Cripples Conference last November. I have pointed out that bad teeth, enlarged tonsils, damp houses may be associated with but are not the cause of rheumatic fever, whilst the one and only thing common to all these cases is malnutrition whereby they get none of the lime-bearing foods such as milk, eggs, and cheese. In addition they aggravate this want of lime intake by the partaking of acids like vinegar, pickles, sauces, and lemons. Where two or three in a family fall a prey it is always found that their feeding habits differ from those who are not attacked. This point is fully emphasised in my article on Heart Disease as a Deficiency Disease which appeared in the *Medical Press* for Sept. 1st, 1926.

I am, Sir, yours faithfully.

Swansea, March 14th, 1927. G. ARBOUR STEPHENS.

[1] THE LANCET, March 12th, p. 568

THE PENALISATION OF THE TUBERCULOUS.

To the Editor of THE LANCET.

SIR,—An assistant in a good sanatorium applied for a similar post in a county sanatorium where there is a pension scheme. He had an interrupted undergraduate career through a breakdown with pulmonary tuberculosis. He made a good recovery and was advised to take up sanatorium work. He secured a place in a sanatorium where research work is done, and he was never one day off duty. He wished to advance and his chief strongly advised him to approach other sanatoria, and he applied for another post. He got on the list at once, when he was specifically asked why there had been a break in his studies, and made no concealment. But he was told that he ought to have announced this in his application, for then "they would not have bothered about him."

The applicant is a friend of mine, and said that he did not mind losing the post, being in a better sanatorium, though on less pay, but he resented the attitude displayed towards him.

Can nothing be done to prevent this penalisation of those who have been tuberculous?

I am, Sir, yours faithfully,

March 15th, 1927. M.O.

CAN TAR CAUSE PULMONARY CANCER?

To the Editor of THE LANCET.

SIR,—I was greatly interested by your note under the above heading on p. 582 of last week's issue. I think it is generally admitted that pulmonary cancer has become much commoner in late years and I have sometimes wondered whether this may not be due to the inhalation of dust from tarred roads.

I am, Sir, yours faithfully,

ROBERT HUTCHISON.

Devonshire-place, W., March 14th, 1927.

THE IMMEDIATE TREATMENT OF THE SEVERELY INJURED.

To the Editor of THE LANCET.

SIR,—Accidents, especially those caused by rapidly moving traffic, are on the increase. Every year a number of these patients are brought to hospitals either dead or in a dying condition. A further number are taken to their own houses or to nursing homes in a similar condition.

This irrational performance is likely to continue until it is generally recognised that a person, when injured so severely as to be nearly dead, is not in a fit state to be carried any distance, no matter what his destination, and that a journey of any length, for a patient who is only just alive, is the most certain method of obliterating his already small chance of survival.

The desperately injured man, if he is in a building where he can be kept warm and at rest, should be kept and treated where he is until he has rallied. If he is in the open and exposed to wind and weather, he should be taken to the nearest available place of shelter and treated there until he is fit to stand the longer journey.

Those responsible for ordering and carrying out the transport, over long distances, of the severely injured who are nearly dead, the ordering of "immediate removal to hospital," so often appearing in the newspapers, are chiefly medical men, police officers, and ambulance workers. In justice to the two latter, it should be remembered that, very often, they are only carrying out the orders of the doctor who has been called to the case.

First-aid and ambulance lecturers can help by teaching their pupils the folly of carrying long distances patients who, as the result of an accident, are nearly dead. But reform, in the immediate treatment of the severely injured, to be effective, must begin in the practice of doctors. Example is better than precept.

I am, Sir, yours faithfully,

Plymouth, March 5th, 1927. C. HAMILTON WHITEFORD.

Medical News.

UNIVERSITY OF OXFORD.—At a recent congregation the following degrees were conferred:—

D.M.—V. S. Hodson.

B.M.—D. A. Robertson, C. S. Broadbent, and M. D. Bower.

The *Sir William Dunn School of Pathology* was handed over to the Vice-Chancellor of the University by Mr. C. D. Seligman, on March 11th, in the presence of a representative gathering. The building, of which we published a picture last week, has in the basement a low-pressure chamber large enough to enable physiological and pathological observations to be made on the effect of altitude on men. A departmental library will occupy part of the ground floor, the rest of the building being devoted to laboratories for teaching, and research animal rooms. Accommodation and equipment for some 50 undergraduates and 25 research students is provided.

The *Rolleston Memorial Prize*, which is now of the value of about £100, is awarded every two years, under the conditions stated below, for original research in animal or vegetable morphology, in physiology and pathology, or in anthropology. No candidate will be eligible (1) who has not either passed the examinations for the B.A. or B.M. degree at Oxford, or for the B.A. or M.B. degree at Cambridge, or been admitted as an advanced student, or as a student for the degree of B.Litt. or B.Sc. at Oxford or as a research student for the degree of M.Litt. or M.Sc. or Ph.D. at Cambridge; (2) who has exceeded a period of six years from attaining one or other of these qualifications, or from attaining the first of such qualifications, if he has attained more than one; (3) who has exceeded ten years from his matriculation. The next award will be made in Trinity Term, 1928. Candidates must forward their memoirs to the Registrar of the University before March 31st, 1928.

UNIVERSITY OF CAMBRIDGE.—At recent congregations the following degrees have been conferred:—

M.D.—W. N. Goldsmith.

M.B. and B.Chir.—B. E. Ahrens, W. A. Bourne, J. C. P. Grey, H. E. Nourse, W. H. Palmer, G. Simon, and D. G. Shields.

M.B.—R. W. Cuningham.

B.Chir.—R. W. B. Ellis, H. J. Heathcote, W. L. Roberts, F. C. Roles, and H. L. Wilson.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council of the Royal College of Surgeons on March 10th, Sir Berkeley Moynihan, President, in the chair, the following were elected Honorary Fellows subject to their personal attendance at the College:—R. Alessandri, Professor of Surgery, Rome University; E. W. Archibald, M.D., Professor of Surgery and Clinical Surgery, McGill University; F.A.B. Krogius, Professor of Clinical Surgery, University of Helsingfors; P. Lecene, Professor of Surgical Pathology, University of Paris; R. Leriche, Professor of Clinical Surgery, University of Strasbourg; R. Matas, M.D., LL.D., Professor of Surgery, Tulane University of Lousiana, New Orleans; and C. Willems, Professor of Operative Medicine, University of Liege. Sir Holburt Waring was re-elected as the representative of the college in the General Council. Mr. Victor Bonney was elected as the representative of the College on the Central Midwives Board. Mr. V. Warren Low, C.B., was re-elected as the representative of the College on the Senate of the University of London. Dr. Geo. Parker, M.R.C.S., was elected Thomas Vicary Lecturer for the ensuing year. A report was received from the Committee which had had under consideration the Resolution carried at the Annual Meeting of Fellows and Members in November last regarding the question of admitting Members to direct representation upon the Council of the College. A recommendation from the Committee that the views of the Fellows be ascertained was adopted, and the exact form of question to be put to the Fellows will be settled at a future meeting of the Council.

Licences to practise dentistry were conferred upon the following 56 candidates (54 men and 2 women), who have passed the requisite examinations and have complied with the by-laws:—

I. Ackers and F. J. Ardouin, Royal Dental; L. E. Balding, C. H. Bandy, G. H. Billison, and J. D. Bowling, Guy's; B. Braude and P. B. Campion, Royal Dental; R. L. Cautley, Guy's; A. H. Chanoch, Royal Dental; S. I. Cohen, W. A. Corry, A. C. Davies, R. L. Duchesne, and T. G. Emberson, Guy's; S. Feitelberg and H. E. Glover, Royal Dental; A. E. Grace, Guy's; G. R. Hall, King's Coll.; V. L. L. Hall and J. H. F. Hilton, Guy's; Doris M. Hobbs, Royal Dental; G. J. Hollis, Guy's; H. Hopson, Liverpool; A. S. Jones, London; F. W. Jones, Royal Dental; C. S. Laurens, Guy's; B. Lieb and S. Lizerbrum, Royal Dental; G. F. H. McCormick, M.R.C.S., M.R.C.P., Univ. Coll.; G. N. Manley, Royal Dental; H. E. B. Mash, King's Coll.; A. L. Murray, Royal Dental; W. H. G. North, Guy's; Frances E. Osborne, Royal Dental; E. A. Page, London; F. R. Phillips and

G. B. F. Reece, Royal Dental; R. Rosefield, Univ. Coll.; J. F. V. Sellin, Bristol; J. Shwer, Royal Dental; R. C. Smart, Manchester; E. N. Stevens, Guy's; N. R. Thompson, Royal Dental; F. S. Tinsley, King's Coll.; R. G. J. Tovey, Royal Dental; R. C. Virgo, London; R. W. Waldie, Guy's; F. A. Walter, Manchester; T. W. Watts, F. T. Wilkinson, H. F. J. Willis, and M. Wolman, Guy's; A. A. Wood, Univ. Coll.; C. H. Woodham and N. C. Yendell, Guy's.

The Diploma of M.R.C.S. was conferred upon Dorothy Bolton, M.B. Calcutta, of Calcutta and Charing Cross Hospitals.

Diplomas in Tropical Medicine and Hygiene were also conferred (in conjunction with the Royal College of Physicians) upon the following 24 candidates (6 women and 18 men) who have studied at the London School of Hygiene and Tropical Medicine, London, and have passed the examination held by the Conjoint Board:—

S. Annecke, E. G. Anthonisz, A. C. L. O'S. Bilderbeck-Catherine V. Burne, N. P. Dalal, T. B. Gilchrist, R. D. Gross, Kathleen M. Halloran, R. G. Keays, H. B. W. Kumm, F. R. Lockhart, A. D. Loganadan, P. H. Martin, F. R. L. Miller, Margaret M. Nolan, J. Portelli-Helen M. Russell, E. G. Sayers, H. M. Shelley, Viva E. K. Stuart, H. S. Townsend, Bertha Williamson, C. J. Wylde, W. A. Young.

UNIVERSITY OF LONDON.—Applications for grants under the Thomas Smythe Hughes Medical Research Fund should be made between May 2nd and June 15th. Applications are also invited for the Laura de Saliceto Studentship for the Advancement of Cancer Research, which is of the value of £150 a year and may be held in conjunction with a physiological, pathological, or clinical appointment. Candidates may be of either sex, and need not be members of the University. The studentship is awarded for not less than two years. Particulars of the Fund and Studentship may be had from the Academic Registrar. A University Studentship in Physiology (£50 for one year) will be awarded to a suitable student or graduate of the University. Applications must be received by the Principal Officer on or before May 31st.

CAMBRIDGE UNIVERSITY MEDICAL SOCIETY: AN INTERESTING TOUR.—In the magazine of the Cambridge University Medical Society for the Lent Term, there is published a provisional programme of a tour to be taken by the members through the laboratories, hospitals and clinics of Germany, Czecho-Slovakia, Austria and France. The party will be escorted round the University medical schools at Hamburg, Berlin, Dresden, Prague, Vienna, Munich, Strasbourg and Paris. It is proposed to leave Southampton on August 24th. The time to be allotted at each centre is not yet published in the programme, but the railway tickets will be valid for 33 days. The tour has been economically planned and the general amenities of the journey have been studied. The cost is £45, and the booking arrangements are in the hands of Messrs. W. W. Bell & Co., 6, King's Parade, Cambridge, to whom all questions about the route and passports should be addressed. An entrance fee of £2, £3, or £4 is payable, according as to whether entry is made on the first day of April, the first day of June, or later, while no applications will be considered after July 14th; the first £2 of the entrance fee counts as part of the fare. These details should be borne in mind by those who propose to join the tour, as, in order to secure reduced railway fares, all tickets for the party must be issued at the same time, and members, if they withdraw after the tickets have been issued, may forfeit the cost. The tour is open to ladies as well as to honorary members in the Cambridge University Medical Society.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Thursday, March 24th, at 5 P.M., Dr. R. Travers Smith will lecture at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, on Emergencies in Neurological Practice. On Tuesday, March 22nd, at 2 P.M., Mr. N. C. Lake will give a clinical demonstration in surgery at Charing Cross Hospital, and at 4 P.M. on March 23rd and the two following days Mr. Levy, Miss Mann, and Mr. Williamson-Noble will give special demonstrations in ophthalmology at the Central London Ophthalmic Hospital. The lectures and demonstrations are free to members of the medical profession. An all-day comprehensive course in Orthopædics, lasting until April 2nd is in progress at the Royal National Orthopædic Hospital. A two weeks course was begun on March 21st at the London Temperance Hospital for the benefit primarily of the general practitioner (4.30-6 P.M.). From March 28th to April 9th the Queen's Hospital will hold a special course in Diseases of Children, instruction at this hospital being chiefly clinical. The Royal Eye Hospital will undertake a series of afternoon demonstrations on the Diagnosis and Treatment of Diseases of the Eye from March 28th to April 8th. The Fellowship arranges for practical courses in anæsthetics and obstetrics, and also makes arrangements for clinical assistantships in gynæcology. Copies of all syllabuses and of the *Post-Graduate Medical Journal* are obtainable from the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting of the Faculty held on March 7th, Dr. Herbert Frederick Blacklee was admitted (after examination) as a Fellow of Faculty.

ROYAL MICROSCOPICAL SOCIETY.—The Conference at Liverpool originally arranged for the third week in March has been postponed till March 29th, 30th, and 31st, owing to difficulty in securing hotel accommodation.

HUNTERIAN SOCIETY.—The third dinner meeting of this society will be held at Simpson's Restaurant, 2 and 3, Bird-in-Hand Court, 77, Poultry, Cheapside, on Monday, March 21st, at 7.30 P.M. A discussion on the Bottle of Medicine will be opened by Dr. L. G. Glover and Dr. Thomson Brown.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on Friday, March 25th, at 5 P.M., in the Town Hall, Leeds, when a discussion on Cancer will be opened by Sir Berkeley Moynihan, followed by Prof. R. D. Passey, Director of Cancer Research, University of Leeds. The chair will be taken by Dr. G. F. Buchan.

UNIVERSITY OF MANCHESTER.—Prof. H. S. Raper has been appointed dean of the medical school as from July next. Mr. P. W. Clutterbuck has been appointed assistant lecturer in physiological chemistry, Mr. E. N. Willmer assistant lecturer in comparative physiology, and Dr. Eugenia R. A. Cooper assistant lecturer in anatomy. The Hill Prize in biochemistry has been awarded to Mr. Eric Boyland.

MEDICO-LEGAL SOCIETY.—A meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W. 1, on Thursday, March 24th, at 8.30 P.M., when Sir Bernard Spilsbury will show a Hat from a Fatal Case of Shooting, and give a short communication thereon. Dr. Letitia Fairfield, C.B.E., will read a paper entitled Some Psychological Reactions of the Physiological Crises in Women, and a discussion will follow. Members may introduce guests on production of a Member's private card.

LISTERIAN SOCIETY, KING'S COLLEGE HOSPITAL, LONDON.—The centenary celebrations of the hospital in connexion with Lister are to be held on April 4th, and will take the form of addresses by house surgeons and dressers who worked under the great discoverer, the subject being the Personality of Lord Lister. These include Sir Watson Cheyne, Major-General G. Carleton Jones, Sir Lenthal Cheatle, Dr. L. V. Cargill, Dr. Allan Macnab, Dr. H. Distin, Dr. H. Perry, Dr. R. A. Gibbons, and Dr. A. Bousfield. Mr. Hamilton Russell of Melbourne may also be present. The proceedings will start at 8 and end at 10 P.M. There will be refreshments, and the St. Thomas's Hospital Band will assist in the proceedings.

THE CENTRAL LONDON OPHTHALMIC HOSPITAL MEDICAL SCHOOL.—A pleasant dinner of the past and present students was held at the Langham Hotel on Friday, March 11th, Mr. Ernest Clarke in the chair. The toast of the hospital and school was proposed by the Chairman, who traced the growth of the hospital since the early days when he was elected to the staff. This was felicitously replied to, for the hospital, by Mr. C. M. Wilkin, Chairman of the Board of Management. Mr. F. A. Williamson-Noble, the Dean, replied for the school and gave an interesting account of its spreading activities. Mr. Stephen Mayou proposed the health of the visitors, which was replied to by Sir John Parsons, and Mr. A. A. Levy proposed the Chairman's health.

CONFERENCE ON TUBERCULOSIS.—The Tuberculosis Society and Society of Superintendents of Tuberculosis Institutions are holding a joint provincial meeting at Oxford from April 7th to 9th. The meetings will be held in the Pathological Lecture Theatre. On Thursday, at 2.30 P.M., Prof. Lyle Cummins will read a paper on the Bovine Tubercle Bacillus in Immunisation; a discussion will follow. At 10 A.M. on Friday Dr. Leonard Hill will open a discussion on the Defensive Mechanism of the Body against Tuberculosis from the Physical and Chemical Aspect; Mr. G. R. Girdlestone and Dr. E. Obermer will read papers dealing with the same subject. On Friday, at 2.15 P.M., Dr. John Freeman will speak on the Defence of the Body from the Bacteriological and Immunological Side. He will be followed by Dr. A. G. Gibson on Secondary Infections in relation to the Progress of Pulmonary Tuberculosis and Dr. A. D. Gardner on the Laboratory Diagnosis of Tubercle. On Saturday, at 10 A.M., Dr. J. Middleton Martin, Dr. D. P. Sutherland, and Dr. Peter Edwards will discuss the Gaps and Flaws in the Public Health Administration of Tuberculosis. On Saturday afternoon members are invited to visit the Wingfield Orthopædic Hospital and the Osler Pavilion. Accommodation will be available for both sexes at Somerville College, at an inclusive charge of £2 for the period of the meeting, or pro rata. Those wishing to be present are asked to communicate as early as possible with Dr. F. J. Blackmore, the Tuberculosis Dispensary, Maxey Road, Plumstead, S.E.18.

MANCHESTER STUDENTS AND HOSPITALS.—In spite of bad weather, Manchester students on Shrove Tuesday succeeded in collecting £12,937 for local hospitals.

BRIGHTON COUNTY BOROUGH MENTAL HOSPITAL.—On March 12th the new electrical installation was inaugurated at this institution at Hayward's Heath by Sir Frederick Willis, Chairman of the Board of Control.

BRITISH COLLEGE OF NURSES.—This College, which has been endowed with £100,000 by an anonymous donor, has secured 39, Portland-place, London, W. 1, as its headquarters. The College and its governing body are composed entirely of registered nurses, whose object is stated to be to raise the standard of post-graduate nursing education and secure the economic stability of the nursing profession.

LONDON TRAFFIC DEATHS.—The Ministry of Transport has convened a conference to be held on March 21st to consider what steps can be taken to reduce the number of street accidents in the metropolis. During 1926 no fewer than 1020 persons were killed in street accidents in the Greater London area, while 47,213 were injured. During the last six years the number of fatal accidents due to street traffic has increased by 55 per cent. and the number of injuries has increased by 125 per cent.

IRELAND AND THE ROYAL ARMY MEDICAL CORPS.—Some uneasiness was caused a few weeks ago, writes our Irish correspondent, by an announcement about admissions to the R.A.M.C. It was stated that a certain number of commissions would be given on the nomination of universities and medical schools, and a list of the universities and schools to which was given the privilege of nomination was appended. In the Irish Free State only the University of Dublin was given this privilege, and neither the National University of Ireland (with its three schools at Dublin, Cork, and Galway), nor the Royal College of Surgeons in Ireland was mentioned. As both these bodies have contributed very largely in the past to the personnel of the Royal Army Medical Corps, their omission from the list of nominating authorities gave rise to some uneasiness lest their graduates and licentiates should be at a disadvantage in the future. The matter was taken up with the Director-General of the R.A.M.C. by the British Medical Association, at the request of its Irish Branch, and assurances have been given that the nomination of graduates or licentiates from any of the Irish schools will be considered on equal terms in the future.

UNIVERSITY OF LONDON ANIMAL WELFARE SOCIETY.—At a meeting of this Society held at University College on March 10th, Sir Arthur Mayo-Robson in the chair, a lecture entitled Animal Welfare from the Point of View of the Veterinary Profession was given by Prof. F. T. G. Hobday. The Chairman said that as a nation we prided ourselves on being humane, but so long as we permitted the painful slaughter of 40,000 beasts in England every working day, when, by simple and certain methods they could be rendered unconscious before slaughter, he feared that we could not honestly claim to be the most humane nation, since Holland, Switzerland, Sweden, Germany and other countries legislated for compulsory humane slaughter. So long as the Ministry of Health's by-law was only permissive it would never be universally adopted, and it entirely depended on the public whether it was made compulsory. He considered that the work of the Society was well worth the attention of educated men. Prof. Hobday said that members of the veterinary profession could do much to help the Society in its first aim—namely, "to disseminate a knowledge of the needs of animals." The second aim, "to initiate a movement which shall extend to Continental and other universities," was especially well thought out, for in certain of the continental countries animals were not always well cared for, and a movement initiated through the universities would attack the problem at the educational fountain-head. After cordially welcoming the advent of the woman veterinarian, Prof. Hobday dealt with faulty feeding and housing, unreasonable chaining of dogs, and cruel methods of destroying vermin, such as rats, mice, and rabbits; he exhibited the humane snare recommended, for want of a better, by the Royal Society for the Prevention of Cruelty to Animals. As regards humane slaughtering, though the pole-axe and the hammer produced instantaneous unconsciousness when the blow was effective, the humane killer was far easier to use. For destroying small animals electrocution or the lethal chamber should be used, preceded in the case of the dog by a dose of morphia. New regulations had recently been made by the Ministry of Agriculture with regard to the importation of animals by sea, and it was to be hoped that they would be as successful as those by which the shameful export of decrepit horses had been brought to an end. Speaking of free veterinary clinics for the poor, Prof. Hobday claimed that the animals of the poor were entitled to skilled diagnosis and treatment, and should not be left to the amateur without professional training.

AN INDUSTRIAL EXPERIMENT WITH VITAGLASS.—Messrs. Ferranti, Ltd., electrical engineers, have had about 33,000 square feet of Vitaglass put into the windows and skylights of a new extension of their works at Hollinwood, near Manchester. About a third of the 400 workers on the two floors thus fitted are under 21 years of age. It is hoped that after a year's experience it may be possible to compare the efficiency and sickness-rates of these employees with those of workers in the old building.

THE HYGIENE OF MARRIED LIFE AND PARENTHOOD.—A course of lectures is being given at Carnegie House, 117, Piccadilly, London, W.1, on Wednesdays at 8.30 P.M. The next lecture will be given on March 23rd by Mr. Leonard Phillips, who will deal with the Hygiene of Pregnancy. The subjects of the remaining lectures will be the Pros and Cons of Contraception, by Dr. Eric Pritchard (March 30th); Problems affecting Husbands and Wives as Fathers and Mothers, by Dr. J. A. Hadfield (April 6th); and the Foundations of Happy Parenthood, by Dr. Flora Shepherd (April 13th). Tickets may be had from the Secretary of the National Association for the Prevention of Infant Mortality, Carnegie House.

INDIA AND THE GENERAL MEDICAL COUNCIL.—On Feb. 17th the Delhi Medical Association entertained Sir Norman Walker, who is visiting India on behalf of the General Medical Council of Great Britain. Dr. J. K. Sen, the President, took the chair. In the course of his address Sir Norman Walker said that the Council was neither a legislative body nor a trade-union. Its sole aim was the welfare of the public which it guarded by keeping a register of those who acquired a certain standard of skill in diagnosis and treatment. The Council in no way interfered with the Universities by laying down a definite course or framing a curriculum, but provided against the unfit by supervision of examination and by fixing the age of the candidates. Nothing was done to weaken the control of the Universities, and friendly rivalry among the various Universities was maintained. The Universities would be well advised to leave off ploughing lonely furrows and concentrate more upon coöperation and coördination. In reply to Col. H. A. Gidney, who discussed the question of establishing an Indian Medical Council, Sir Norman Walker referred to Part II. of the Medical Act of 1886, which laid down that the King in Council might extend the Act to apply to any British Possession or foreign country. The procedure was for that country, or its universities, to apply through the General Medical Council. In India, the formation of such a body would be welcome if only to facilitate the work of the General Medical Council. Dr. A. C. Sen appealed to Sir Norman Walker to assist in establishing a General Medical Council in India, which alone could tackle problems such as research into indigenous drugs, preparation of an Indian pharmacopœia, legislation for standardisation of pharmaceutical and biological preparations, prohibition of unqualified medical practice, revision of the medical curriculum, and employment of independent medical men in Government hospitals.

At the dinner which followed, Dr. Bazaz proposed the toast of the Guests, and Dr. S. P. Shroff the toast of Success to the Medical Profession. The last toast was the Delhi Medical Association, given by Dr. Hari Ram. Colonel Gidney, replying for the guests, laid stress on the Anglo-Indian being regarded as Indian first, and deplored the persistence of such anomalies as those connected with the posts of subassistant and assistant surgeon, and the privileges of the Indian Medical Service and Royal Army Medical Corps. Dr. Rama Rao, who followed, referred to his Indian Medical Education Bill and its poor prospects of success unless it were supported by Government. He hoped to enlist support by removing certain clauses from the Bill.

The proceedings ended with a vote of thanks to the chair by Dr. H. Sen.

HARVEIAN SOCIETY.—At a meeting of this Society on March 10th, Dr. E. Le Fevre Payne, the President, in the chair, Sir Berkeley Moynihan delivered the Harveian Lecture for 1927, on Diverticula of the Alimentary Canal. The lecture was illustrated by photographs and skiagrams. The Oxford Dictionary, said Sir Berkeley Moynihan, defined a diverticulum as "a little wayside house of ill-fame," a title which was well deserved. In the alimentary canal it was due to protrusion of the mucous membrane from the lumen of the bowel; the other coats might or might not participate. Budding from the intestinal wall was an essential step in the formation of various organs. Examples of diverticula were (1) the pancreas, which maintained connexion with the alimentary canal through its ducts; (2) the appendix which had no differentiation into a duct; and (3) the thyroid which was a ductless gland. The foramen cæcum on the dorsum of the tongue was the only patent part of this diverticulum. Diverticula might develop normally in fœtal life but their connexion with the gut in the adult might be curtailed or disappear. Thus

Meckel's diverticulum was the unclosed part of the omphalomesenteric duct, whilst the pouch of Rathke usually vanished completely in a few years. Alternatively, diverticula might develop and in normal circumstances disappear in fœtal life. Sometimes this atrophy and disappearance might not take place, so that in adults the diverticulum persisted. Diverticula from the stomach, duodenum, and jejunum were frequently found in the fœtus and showed little masses of cells at their extremities, identical with the cells from which the pancreas arose. It seemed that a whole series of efforts were made by the organism to develop the pancreas, the only ones which survived being those connected with the ducts of Wirsung and Santorini. Diverticula were classified as: (1) Those which arose as a bud from the wall of the intestine during development and contained all the coats of the bowel at that point; these were spoken of as congenital in origin and true in structure. (2) Those occurring after development was complete, as a result of some abnormal process; these never contained all the intestinal coats and were called acquired and false. (3) Pulsion or traction diverticula. A traction-pulsion variety also occurred. The changes which might take place in a diverticulum were inflammation in and around the sac, suppuration, sloughing and gangrene, perforation, formations of adhesions, carcinomatous change, and rotation of the sac.

Diverticulosis, he thought, was much more frequent than had been supposed, but often it did not require surgical intervention. He did not believe in giving these subjects food which left little residue; they should take as much paraffin as they could stand, and have a weekly clearance of the bowel by taking a large dose of aperient. Sir D'Arcy Power proposed, and Sir William Willcox seconded, a vote of thanks to Sir Berkeley Moynihan.

GLASGOW SAMARITAN HOSPITAL.—Lady Blythswood has opened a new wing of the Royal Samaritan Hospital for Women. The building and its equipment have cost £80,000, £78,000 of which was raised by a bazaar held in 1924.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 5TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox 529 (last week 438), scarlet fever 1178, diphtheria 1006, scarlet fever 31, pneumonia 3375 (last week 3828), puerperal fever 35, puerperal pyrexia 115, cerebro-spinal fever 12, acute poliomyelitis 17, acute polio-encephalitis 4, encephalitis lethargica 49, continued fever 1, dysentery 6, ophthalmia neonatorum 109. No cases of cholera, plague or typhus fever was notified during the week.

Of the cases of small-pox 96 were reported from Wales, 1 only from Glamorgan, the remainder from various parts of Monmouth, with heaviest incidence on the town of Abersychan. The 128 cases from the West Riding of Yorkshire were reported chiefly from Sheffield 28, Conisbrough 28, Swinton 14, Mexborough 11, and Doncaster 9. The county of Lancaster was free. During the week ended March 12th, further cases of small-pox were notified from the mining valleys of Monmouthshire, bringing the total number discovered up to close on 270. There is, however, no extension of the area of the outbreak. A fourth definite case of small-pox has occurred in Newport. The proposal to use Usk Prison as a temporary small-pox hospital has met with much opposition from the inhabitants of Usk and the farmers using the market in that town. The prison, however, has been acquired, but will not be used unless it is absolutely necessary. No further cases have been reported from the County of Glamorgan.

Deaths.—In the aggregate of great towns including London there were no deaths from small-pox, 2 (0) from enteric fever, 73 (0) from measles, 5 (1) from scarlet fever, 216 (28) from whooping-cough, 62 (16) from diphtheria, 53 (9) from diarrhœa and enteritis under two years, and 898 (69) from influenza. The figures in parentheses are those for London itself. The influenzal deaths for the week ended Mar. 12th show a further substantial diminution, both in London and in the great towns generally, the figures being 105 Great Towns 572, London 49, Liverpool 22, Manchester 58, Birmingham 33, Sheffield 28, Bolton 22, and Stoke-on-Trent 21.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

SALE OF FOOD AND DRUGS BILL.

THE Sale of Food and Drugs Bill which has been introduced into the House of Commons by Mr. JACOB was considered by Standing Committee A on Tuesday, March 8th. Mr. SHORT was in the chair. Clause 1 provides that—

"Where any Regulations made under the Public Health (Regulations as to Food) Act, 1907, prescribe the compositions of any article of food or drink or prohibit or restrict the addition of any preservative or other ingredient or material to any such article, such Regulations shall be deemed for the purposes of the Sale of Food and Drugs Acts, 1875 to 1907, to define the nature, substance and quality of the article as regards the presence or amount of any ingredient or material specified in the Regulations and to determine whether the addition of any such ingredient or material, and, if so, what amount thereof renders the article injurious to health."

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) moved an amendment designed to make it clear that the Public Health Acts of 1875 and 1896 were incorporated in this measure. The amendment was agreed to. Sir KINGSLEY WOOD moved another amendment to provide that the regulations should be conclusive, not merely in regard to the presence or amount of such added ingredients as were referred to earlier in the Bill—that was preservatives or colouring matter—but also in so far as they dealt with this point in regard to natural constituents as well. The Minister of Health was advised, he said, that he had no power to prescribe standards for foods generally by regulations under the Act of 1907, and therefore without any further statutory authority no article other than dried or condensed milk could be affected by this particular amendment. The amendment was agreed to. A further Government amendment was also agreed to, the purpose of which was to save the local authorities from having to prove that the presence of a forbidden preservative, or the excessive amount of restricted preservative, was injurious to health. This amendment fixes a standard as designed in the Bill. The Committee stage of the Bill was completed and it was ordered to be reported to the House.

MIDWIVES AND MATERNITY HOMES (SCOTLAND) BILL.

The Midwives and Maternity Homes (Scotland) Bill, presented in the House of Commons by Mr. BARCLAY-HARVEY, supported by Sir G. BERRY, Lt.-Col. FREMANTLE and others is a measure designed to extend to Scotland the chief provisions of the Act which was passed last year for the control of midwives and maternity homes in England.

MENTAL DEFICIENCY BILL.

The text of the Mental Deficiency Bill, which has been introduced in the House of Commons by Mr. CROMPTON WOOD, has now been issued. In a memorandum attached it is explained that the main object of the Bill is to amend the definition of defectives which are contained in the Mental Deficiency Act, 1913. Under these definitions only persons who were mentally defective from birth or from an early age come within the Act, and there is thus no power to deal with cases where the defectiveness arises at a later stage. An illustration is afforded by the disease known as encephalitis lethargica, though these particularly need the sort of care and treatment which can be provided in a mental deficiency colony. The effect of the Bill (Clause 1) is to eliminate the words "from birth or from an early age" and to bring within the scope of the Act all cases of mental deficiency which arise before the age of 18, whether due to inherent causes or induced by disease or injury. Under the existing Act a defective may be placed under care if he is found to be also "neglected, abandoned, or without visible means of support or cruelly treated." Clause 2 (1) of the Bill extends this provision to a case where the care or training which the defective requires cannot be provided in his own home. Subsections (2) and (3) of Clause 2 are designed to provide that any case may be dealt with by any one of the three methods recognised by the Act—viz., providing supervision, placing under guardianship, or sending to an institution, while Clause 3 merely introduces a drafting amendment into the Act of 1913 to make it clear that Section 4 of that Act only applies to the two latter of these methods. Clause 4 will enable an order to be made on a petition without the consent of the parent or guardian, if owing to his being abroad the attempt to obtain it would unduly delay the proceedings on the petition. Clause 5 provides that if a patient is away from an institution on leave of absence he need not be brought back to the institution for examination in connexion with the continuation report required under Section 11 of the Act. Clause 6 makes explicit the power and duty of local

authorities to provide suitable training for mental defectives whilst under supervision as well as in institutions. Although the Act authorises the combination of local authorities, it does not enable a local authority to provide additional beds which could be lent to other authorities. Clause 7 (1) provides for such a procedure. Clause 7 (2) enables the local mental deficiency authority and the local education authority (who have responsibility for certain classes of defectives of school age) to provide an institution jointly.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 9TH.

Duties on Imported Drugs.

Mr. FENBY asked the President of the Board of Trade why the exemption orders applied for since last August under Section 10 (5) of the Finance Act, 1926, in respect of phenacetin, phenazone, oxalic acid, hydroquinone, and other products liable to duty under Part I. of the Safeguarding of Industries Act, 1921, had not yet been issued; and if he was aware that the effect of the undue delay in issuing the exemption orders was that users were compelled to pay at least one-third more than would otherwise be the case for these materials, which had to be imported as they were not made here.—Sir BURTON CHADWICK (Parliamentary Secretary to the Board of Trade) replied: An order under Section 10 (5) of the Finance Act, 1926, exempting certain articles from duty, was made by the Treasury on Monday last.

THURSDAY, MARCH 10TH.

Surgical Opinion and Light Metal Limbs.

Major HILLS asked the Minister of Pensions whether, seeing that surgical opinion was overwhelmingly in favour of light metal limbs, whether for amputations above or below the knee, it was the practice of the Ministry to issue such light metal limbs in all cases of amputation below the knee or only in special cases; and if the latter, on what principle was a distinction made.—Major TRYON replied: I am not aware of any authority for the assumption made by my hon. and gallant friend in the first part of the question, but I may say that light metal limbs are issued both for above and below knee amputations in every case recommended by the surgeons. In many cases, however, the wooden limb, which has now been so far improved that it is actually lighter than the metal limb, is regarded both by the pensioner and the surgeon as more suitable, especially in amputations below the knee.

A Case of Sexual Aberration.

Colonel WEDGWOOD asked the Home Secretary whether his attention had been called to a sentence of six months' imprisonment with hard labour passed by the North London police-court magistrate on a labourer, Wright, for cutting off a tress of a girl's hair; whether he was aware that this offence was a well-known sexual aberration; and would he recommend that the sentence be remitted.—Sir. W. JOYNSON-HICKS replied: The answer to the first two parts of this question is in the affirmative. The answer to the third part is in the negative.

Blind Persons in England and Wales.

Mr. SHORT asked the Minister of Health the total number of blind persons in England and Wales on Dec. 31st, 1926.—Mr. CHAMBERLAIN replied: The last return of blind persons registered in England and Wales was made on March 31st, 1925, and showed a total of 42,140. A further return will be asked for on March 31st next.

Education of Blind Children.

Mr. ROBERT MORRISON asked the President of the Board of Education to give the present estimated number of blind or partially blind children who might benefit by admission to special schools; how many of these children were at present in special schools; how many in public elementary schools; how many in residential institutions; and how many were not attending any school.—Lord EUSTACE PERCY replied: The following are the particulars asked for:—

	Blind.	*Partially Blind.*
Total number of blind and partially blind children ascertained by local education authorities in 1925	2000	4692
Number attending special schools	1642	2258
Number attending public elementary schools	63*	2069
Number in other institutions	33	26
Number not attending any school ..	262*	339

* The fact that these children are not attending special schools is due in the main to the unwillingness of the parents to have their children sent to residential schools.

Mr. SHORT asked the President of the Board of Education what was the number of sightless children of elementary school age on Dec. 31st, 1926.—Lord EUSTACE PERCY replied: The number of totally blind children between the ages of 5 and 16 ascertained by the local authorities during the year ended Dec. 31st, 1925, the last year for which complete returns are available, was 2000.

Local Authorities and the Blind.

Mr. SHORT asked the Minister of Health to state what was the number of local authorities who had availed themselves of the provisions of The Blind Persons Act, 1920, and provided schemes for the welfare of the blind; and the number of persons involved.—Mr. CHAMBERLAIN replied: There are 145 local authorities in England and Wales under the Blind Persons Act, 1920, and all of them have made, and put into operation, schemes for promoting the welfare of the blind. These schemes cover all the registered blind persons in the country.

Welfare Schemes for the Blind.

Mr. SHORT asked the Minister of Health the total expenditure upon welfare schemes for the blind during 1926.—Mr. CHAMBERLAIN replied: Figures are not available for the calendar year 1926. In the financial year ended March 31st, 1926, Government grants in aid of the welfare of the blind amounted to £103,994. The expenditure of local authorities was approximately £136,000. The income from voluntary sources of the voluntary agencies for the blind which are assisted by Government grant was £120,403.

Government and Lunacy Law Reform.

Mr. SEXTON asked the Minister of Health if any action was being taken to incorporate the report of the Royal Commission on Lunacy and Mental Disorder in an Act of Parliament.—Mr. CHAMBERLAIN replied: Steps are being taken to examine the report with a view to incorporating in a Bill such of the recommendations as the Government are able to adopt. It will not, however, be practicable to prepare such a measure in time for introduction in the present Session.

Inspection of Dairies.

Mr. SITCH asked the Minister of Health the number of dairies in England and Wales and the number inspected in the 12 months ending Dec. 31st, 1926, by the two milk inspectors.—Mr. CHAMBERLAIN replied: Information is not available as to the number of dairy farms in England and Wales, but it is estimated to be over 200,000. The number of farms inspected in 1926 by the two milk inspectors of my department was 220, these being farms for which a licence to sell Certified or Grade A (Tuberculin Tested) milk was held or applied for. The responsibility for the supervision of other farms rests with local authorities.

Motor Drivers and Medical Unfitness.

Mr. DAY asked the Home Secretary the number of applicants for licences to drive either a taximeter cab or omnibus who had been refused the same by him during the 12 months ended to the last convenient date; and the reason why these licences had been refused.—Sir W. JOYNSON-HICKS replied: 142 applicants for licences were refused during the period March 1st, 1926, to Feb. 26th, 1927. The grounds of refusal were: medical unfitness, 42; inquiry unsatisfactory, 100. This neglects one applicant who was refused a motor omnibus driver's licence at the time, but who has since been granted one.

MONDAY, MARCH 14TH.

Medical Services in the Navy.

On the motion that the Speaker do leave the Chair on the House going into Committee on the Navy Estimates,

Mr. BRIDGEMAN (First Lord of the Admiralty), said there was one small point which was rather an important one, although it was not a question of a great deal of money. That was the Royal Naval Medical Service. Recruitment for that Service had been unsatisfactory for some considerable time. He need not go into the causes of it. A Committee was set up to look into the conditions of the service, and to inquire into the causes of the difficulty of recruiting.

Commander BELLAIRS: Was that exclusive to the Navy?

Mr. BRIDGEMAN said that it was for all the Services. As a result certain improvements had been effected, and were notified in July last in Fleet Orders. The principal improvements were that greater facilities had been given to the young doctors to specialise in various branches of their profession, which were not naturally easily available in sea service. Improved allowances had been given to holders of specialist posts, and charge pay had been approved of for medical officers in charge of hospital and sick quarters. Also any candidate who held a house appointment at a recognised hospital was allowed to ante-date his seniority by one year, the object being to attract if they could the most efficient of the younger medical students. They had also established an addition to the dental officers by increasing their establishment from 48 to 64.

Sir B. FALLE said that if a man fell ill in the Navy he was sent to the Fleet Surgeon who on his own responsibility alone decided whether the man was to be discharged from the

Service or not. That was absolutely wrong. The medical service in the Navy was a great service and the men in it were as able as could be found anywhere, but it should not rest with one man to decide in a matter of life and death of this kind. No man was infallible, not even a doctor, and if a man was going to be thrown out he should have the right to go before a Board. He suggested that if they had a Fleet Surgeon, a civil practitioner and a man like the Town Clerk of Portsmouth, and those gentlemen would give their services for nothing, the Navy would be absolutely satisfied to abide by their decisions. 196 men were thrown out of the Service this year for tuberculosis alone. Only 6 of them or about 3 per cent. were given any pension for the illness they had contracted in His Majesty's Service. Men suffering from tuberculosis dare not go sick, because if they did they knew that the Fleet Surgeon would throw them out on the beach. That was a wicked thing for any Government to do. He urged that these men should be allowed to appeal to the Board of Admiralty. Such an appeal should be made automatic and a matter of right.

Lt.-Col. HEADLAM (Parliamentary Secretary to the Admiralty), replying to Sir B. Falle, said that everybody who knew anything about the subject must sympathise most profoundly with the point of view which the hon. Member had put forward. He doubted very much whether they could get other medical opinion quite so easily as Sir B. Falle seemed to imagine. No one who had had anything to do with medical boards or medical officers generally would think that they were going to change their views so rapidly as the hon. Member seemed to think. Whether or not an automatic appeal to the Board of Admiralty would help the men he rather doubted, but if Sir B. Falle would let him know of a definite case where men had been hindered from appealing to the Admiralty, the matter should be looked into.

The motion was agreed to.

Veterinary Work in Colonies and Protectorates.

Mr. RAMSDEN asked the Secretary of State for the Colonies what sums had been expended from crown colony and other funds in obtaining expert advice with regard to veterinary matters affecting the crown colonies, protectorates, and mandated territories.—Mr. AMERY replied: I assume that my hon. friend does not refer to expenditure on the maintenance of Veterinary Departments and their staffs or to such expert advice as is given in the ordinary course of their work by the Imperial Bureau of Entomology or by the Bureau of Hygiene and Tropical Diseases in its "Veterinary Bulletin" but to special expert advice. A grant of £10,000 has been made from the Empire Marketing Fund for the purpose of carrying out an investigation into the mineral content of natural pastures in Kenya, acting under the advice of Dr. J. B. Orr of the Rowett Research Institute. It is not possible to state how much of this sum will actually be expended in Kenya. At the request of the Nigerian Government, Dr. P. J. du Toit, Deputy Director of Veterinary Education and Research in the Union of South Africa, visited the Colony in January last to investigate mineral deficiency in pastures, and to report generally on local Veterinary matters. The cost to Nigeria of the visit was approximately £150.

The Tuberculosis Order 1925.

Mr. BUXTON asked the Minister of Agriculture the number of cows slaughtered under the Tuberculosis Order, 1925, since the Order came into force; and the amount spent in compensation.—Mr. GUINNESS replied: From Sept. 1st, 1925, to Dec. 31st, 1926, 23,369 cows were slaughtered by Local Authorities under the Tuberculosis Order, 1925, for which compensation amounting to £90,184 was paid.

Chester-le-Street Guardians and Public Funds.

Sir WILLIAM DAVISON asked the Minister of Health whether his attention had been called to the misappropriation of public funds by the board of guardians of Chester-le-Street, Durham, during the coal strike; whether he had taken legal opinion as to whether the persons concerned were guilty of having entered into an illegal conspiracy; and what action the Ministry were taking in the matter.—Sir KINGSLEY WOOD replied: Yes, Sir, my right hon. friend does propose to draw the attention of the Director of Public Prosecutions to this matter.

Treatment of Flour with Chemical Substances.

Rear-Admiral BEAMISH asked the Minister of Health whether he proposed, by legislation or otherwise, to carry into effect the recommendations, or any of them, of the departmental committee on the treatment of flour with chemical substances.—Sir KINGSLEY WOOD replied: The report of the departmental committee is at present under consideration, and my right hon. friend is not yet in a position to make any statement as to the action to be taken on their recommendations.

Pupils in Certified Special Schools.

Mr. ROBERT MORRISON asked the President of the Board of Education the number of pupils in certified special schools for the blind, deaf, mentally defective, physically defective, and epileptic children in each of the age groups 13–14, 14–15, 15–16, and over 16, respectively, on March 31st, 1926. Lord E. PERCY replied: The following is the information asked for:—

Type.	13–14.	14–15.	15–16.	16 and over.
Blind	613	361	288	54
Deaf	496	480	416	71
Mentally defective ..	2629	2103	1465	241
Physically defective ..	2486	1360	770	100
Epileptic	96	96	76	13

Night Work in Bakeries.

Mr. WILLIAM THORNE asked the Home Secretary if his attention had been called to the statement made by the coroner at the inquest on a baker who died at Sunninghill, Berkshire, in connection with the deceased having worked 14 to 15 hours for six nights per week; if he was aware that a two-thirds majority was secured in favour of the abolition of night work in bakeries by the League of Nations Geneva Conference; and whether it was the intention of the Government to ratify the Geneva decision.—Captain HACKING, Under Secretary to the Home Office, replied: My right hon. friend has not seen the statement of the coroner, but since his attention was called to the case by the hon. Member's question, he has made some inquiries. So far as I have been able to ascertain, it appears to have been the case that the man was being employed for excessively long hours, and at a time when he was in an advanced stage of tuberculosis. My right hon. friend regrets that there is no action which he can take in the matter. The long hours would not have been prevented by the ratification of the Night Baking Convention, the effect of which is only to prevent employment during a certain period of the night, and my right hon. friend has already explained on previous occasions why the Government do not see their way to ratify the Convention which their representatives voted against at Geneva.

TUESDAY, MARCH 15TH.

Manufacture of Poison Gas in Russia.

Sir ALFRED KNOX asked the Secretary of State for War whether he was aware that several factories were being operated by the Soviet Government in Russia for the manufacture of poison gas; and the number and location of such factories and the present and potential output.—Sir L. WORTHINGTON-EVANS replied: His Majesty's Government has information that the study of gas warfare is being actively pursued in Soviet Russia, numerous factories have been set up and are in course of erection, which are or will be capable of poison gas production on a very considerable scale. It is not considered that any useful purpose will be served by detailing the number and location of such factories, or by indicating their present and potential output, but there is no doubt that the Soviet military authorities are actively studying this type of warfare and making preparations on a large scale for its possible eventual use.

Miners' Nystagmus.

Mr. SHORT asked the Secretary for Mines what was the number of cases of miners' nystagmus during 1925 and 1926, respectively; whether the incidence of this disease was still heavy; and what action, if any, he proposed to take.—Colonel LANE FOX replied: In 1925 thenumber of new cases in which compensation was paid was 3444 and the number continued from previous years was 7890. The figures for 1926 are not yet available. The Mining Association and the Miners' Federation have been invited to coöperate with the Home Office to give effect to the recommendation of the Nystagmus Committee, and continual efforts are being made to improve lighting in mines.

Outbreak of Anthrax at the Zoological Gardens.

Sir WILLIAM DAVISON asked the Minister of Agriculture whether, in view of the recent outbreak of anthrax at the Zoological Gardens in London, he would consider the advisability of extending the present Contagious Diseases of Animals Order so as to include all animals in the United Kingdom, wild as well as domesticated.—Mr. GUINNESS replied: Yes, Sir, I am at present considering the advisability of including within the scope of the Anthrax Order of 1910, all animals susceptible to anthrax which are kept in public or private zoological collections and travelling menageries.

Tuberculosis Research.

Mr. DAY asked the Minister of Health the total amount of the sums expended during the year ending Dec. 31st last in respect of tuberculosis research work.—Sir G. HENNESSY (Vice Chamberlain of the Household) replied: The sum of £4846 was expended by the Medical Research Council during the 12 months to Dec. 31st, 1926, on research work upon specific problems of tuberculosis. This excludes the cost of research into fundamental problems of which the bearing upon tuberculosis cannot be calculated, and also the cost, not separately estimated, of work in this subject by members of the Council's own staff in the National Institute for Medical Research.

Young Persons Killed in Coal-mines.

Mr. CAPE asked the Secretary for Mines what was the number of young persons under the age of 18 killed in the coal-mines of this country during the months of December, 1926, and January and February, 1927.—Colonel LANE FOX replied: 20 persons under 18 years of age were killed at coal-mines in Great Britain during the months of December, 1926, and January and February, 1927.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W:
THURSDAY, March 24th.—4.30 P.M. *The following Papers will be read*: Sybil Cooper, D. E. Denny-Brown, and C. S. Sherrington: Interaction between Ipsilateral Spinal Reflexes acting on the Flexor Muscles of the Hind-limb: F. W. R. Brambell: The Development and Morphology of the Gonads of the Mouse. Part I., The Morphogenesis of the Indifferent Gonad and of the Ovary (communicated by Prof. J. P. Hill). R. J. Ludford: The Golgi Apparatus in the Cells of Tissue Cultures (communicated by Dr. J. A. Murray). C. E. Walker and Margaret Allen: The Nature of Golgi Bodies and other Cytoplasmic Structures appearing in Fixed Material (communicated by Sir John Farmer). W. S. Patton, and E. Hindle: The Development of Chinese *Leishmania* in *Phlebotomus major var. Chinensis* and *P. sergenti, var* (communicated by Dr. H. H. Dale). G. S. Sansom: The Giant Cells in the Placenta of the Rabbit (communicated by Prof. J. P. Hill).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, March 22nd.—5 P.M., MEDICINE, DISEASE IN CHILDREN AND DERMATOLOGY. Special joint discussion: The Uses and Limitations of Ultra-violet Light Therapy. Speakers will include Dr. S. Ernest Dore, Dr. J. H. Sequeira, and Dr. Albert Eidinow.
WEDNESDAY.—4.30 P.M., PSYCHIATRY. Pathological Meeting in the laboratory at the Maudsley Hospital, Denmark Hill, S.E. 5, by the courtesy of Dr. Golla. Tea will be provided before the meeting.
THURSDAY.—8.30 P.M., UROLOGY. Clinical Pathological Meeting.
FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.). Cases: Dr. Bernard Myers: (1) Essential thrombocytopenic Purpura Hæmorrhagica, 15 months After Splenectomy. (2) Specimen Showing Atresia of the Duodenum. Mr. D. C. L. Fitzwilliams: (3) Case of Deformity of Foot as Result of Osteomyelitis. (4) Case of Dislocation of Cervical Vertebra as Result of a Fall. Dr. Kenneth Stone: (5) Case of Splenomegaly for Diagnosis. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. *Paper*; Dr. W. St. C. McClure: The Incidence of Pneumonia.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, March 25th.—8.30 P.M., Dr. J. H. Sequeira: The Place of Venereal Disease in the Medical Curriculum. A Discussion will follow.

ILLUMINATING ENGINEERING SOCIETY.
TUESDAY, March 22nd.—6.30 P.M. (at the Lighting Service Bureau, 15, Savoy-street, Strand, W.C. 2.), discussion (illustrated by lantern slides) on Various Problems in Illumination and Practical Solutions.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1 Wimpole-street, London, W.
MONDAY, March 21st, to SATURDAY, March 26th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, Cavendish-square, W., at 5 P.M. on Thurs. Dr. R. Travers Smith: Emergencies in Neurological Practice. Open to all members of the medical profession without fee.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Wed., Mr. Levy: Thurs., Miss Mann; Fri., Mr. Williamson-Noble. Special demonstrations in ophthalmology at 4 P.M. Free to members of the medical profession. CHARING CROSS HOSPITAL, King William-street, W.C. Tues., 2 P.M., special demonstration in clinical surgery by Mr. Lake. No fee to members of the medical profession.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special course in gynæcology.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. 4.30 to 6 P.M., General Practitioners course. Medicine, Surgery and the Specialties.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. Comprehensive course. Morning and afternoon sessions.
Further information from the Secretary.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 22nd.—5 P.M., Sir Charlton Briscoe: The Muscular Mechanism of Respiration and its Disorders (First Lumleian Lecture).
THURSDAY.—5 P.M., Sir Charlton Briscoe (Second Lumleian Lecture).

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, March 21st.—10 A.M., Surgical Clinic. 2 P.M., Medical Cases in the Wards. 2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.
WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
On TUESDAY, March 22nd, and THURSDAY, March 24th, at 2.30 P.M., there will be special demonstrations of Medical and Surgical cases by Dr. F. G. Crookshank and Mr. H. W. Carson respectively.
Also on FRIDAY, March 25th, at 4.30 P.M., Dr. L. R. Yealland will demonstrate on Selected Cases of Nerve Diseases.

ROYAL NORTHERN HOSPITAL POST-GRADUATE COURSE.
TUESDAY, March 22nd.—3.15 P.M., Mr. G. G. Penman: Injuries to the Eye.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, March 24th.—4 P.M., Mr. A. T. Pitts: Dental Caries in Young Children.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, March 22nd.—5 P.M., Dr. H. G. Adamson: Benign Growths of the Skin.
THURSDAY.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY.
WEDNESDAY, March 23rd.—5.30 P.M., Mr. H. Stobie: The Lower Third Molar.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, March 22nd.—4.15 P.M., Mr. W. H. Hey: Surgical Aspect of Diseases of the Spleen.
FRIDAY.—4.15 P.M., Mr. F. H. Westmacott and Mr. D. L. Sewell: Demonstration of Aural Cases.

ANCOATS HOSPITAL, POST-GRADUATE LECTURES, Mill-street, Manchester.
THURSDAY, March 24th.—4.15 P.M., Dr. Arnold Renshaw: Recent Advances in Chemotherapy.

ST. MARY'S HOSPITALS, MANCHESTER. POST-GRADUATE LECTURE.
FRIDAY, March 25th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. J. W. Bride: Obstetric Hæmorrhage.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, March 25th.—3.30 P.M. (at the Royal Hospital), Dr. Grout: Radiology in Diagnosis.

PEOPLE'S LEAGUE OF HEALTH. (Sims Woodhead Health Lectures.)
MONDAY, March 21st.—6 P.M. (at the Medical Society of London 11, Chandos-street, W.), Prof. H. R. Kenwood: Hygiene.

Appointments.

PEARSON, WILFRED J., D.M. Oxf., M.R.C.P. Lond., has been appointed Honorary Physician to the Children's Department, University College Hospital.

Manchester Royal Infirmary: SUTHERLAND, D. M., M.D. Manch., F.R.C.S. Eng., and BAILEY, K. V., M.C., M.D., Ch.B. Manch., Assistant Surgical Officers; ELLIS, R., M.B., Ch.B. Camb., Cardiological Registrar; SUSMAN, W., M.D. Ontar., and POLSON, C., M.B., Pathological Registrars; DRINKWATER, S. W., M.B., Ch.B. Manch., and MILNER, S. M., B.Ch. Camb., Surgical Registrars; WHITROW, Miss F., M.B., Ch.B. Manch., and MACLEAN, Miss G., M.B., Ch.B. Manch., Clinical Assistants; SMITH, G. S., M.B., Ch.B. Manch., Assistant to the Director of the Clinical Laboratory; SHAFFER, RAPHAEL, M.B., Ch.B. Manch., Assistant Medical Officer in the Massage and Electrical Department; BROCKBANK, W., M.A., B.Ch. Camb., Resident Medical Officer; MORRIS, L., M.B., Ch.B. Manch., Assistant Resident Surgical Officer; LANGFORD, G. F., M.B., Ch.B. Manch., Resident Clinical Pathologist; SANDIFORD, B. R., M.B., Ch.B. Manch., JONES, G. W., M.B., Ch.B. Manch., RAY, W. H., B.M., B.Ch. Oxf., SHEEHAN, M., M.B., Ch.B.

Manch., Resident House Physicians; PENDLEBURY, R., M.B., Ch.B. Manch., ILLINGWORTH, R., B.M., B.Ch. Oxf., MITCHELL, D. E. J., M.R.C.S., L.R.C.P. Lond., POYSER, R. H., M.B., Ch.B. Manch., ANDERSON, J. K., M.B., Ch.B. Manch., SISSONS, H., M.R.C.S., L.R.C.P. Lond., ROFF, C. D., M.B., Ch.B. Manch., STARR, D., M.B., Ch.B. Manch., MOLL, G. S. W., M.B., Ch.B. Manch., SIMMONS, H. T., M.B., Ch.B. Manch., DAVIS, A. A., M.B., Ch.B. Manch., WHITLEY, J. T., M.B., Ch.B. Manch., Resident House Surgeons; EDWARDS, Miss M. E., M.B., Ch.B. Manch., STUBBS, Miss J. B., M.B., Ch.B. Manch., HARBURN, Miss M. M.B., Ch.B. Manch., Resident House Surgeons (Central Branch).

Queen Charlotte's Maternity Hospital: CHISHOLM, W. N., M.B., Ch.B. Edin., Senior Resident Medical Officer; SANKEY, J. N., M.B., Ch.B. Birm., F.R.C.S. Eng., Assistant Resident Medical Officer; ALDRIDGE, J. S., M.R.C.S., L.R.C.P. Lond., District Resident Medical Officer.

St. Thomas's Hospital: PAGE, C. MAX, M.S. Lond., F.R.C.S. Eng., Surgeon; COOKE, A. M., M.B., B.Ch. Oxf., M.R.C.P. Lond. Resident Assistant Physician; PATRICK, C. V., M.B., B.Ch. Camb., F.R.C.S. Eng., Resident Assistant Surgeon; TOMPSON, B. E., M.B., B.Ch. Oxf., Medical Registrar; BOGGON, R. H., M.B., B.S. Lond., F.R.C.S. Eng., Surgical Registrar; SIMS, T. H. M.B., B.Ch. Camb., Obstetric Registrar; BARRETT, J. C., M.B., B.S. Lond., Senior Resident Surgical Casualty Officer; BAUWENS, P., M.R.C.S., L.R.C.P. Lond., Medical Officer in charge of Electro-Therapy Department.

Certifying Surgeons under the Factory and Workshop Acts: REYNOLDS, B. R., L.R.C.P. Lond., M.R.C.S. (Fenny Stratford); RENDLE, A. R., L.R.C.P. Lond., M.R.C.S. (Godalming); UNWIN, F. A., L.M.S.S.A. (Downham Market); COOK, O., M.B., Ch.B. Edin. (Walsall); MACRAE, J. W., M.B., Ch.B. Aberd. (Banff).

Vacancies.

For further information refer to the advertisement columns.

Bermondsey Borough, S.E.—Asst. Tuberculosis O. £600.
Birmingham Union, Dudley-road Hospital.—Two H.S.'s. £200 and £150 respectively.
Brighton County Mental Hospital, Hayward's Heath.—Second Asst. M.O. £350.
Brighton, New Sussex Hospital, Windlesham-road, —H.S. At rate of £50.
Brighton, Royal Sussex County Hospital.—Hon. S., Hon Asst. S. Also Hon. Med. Clin. Assts.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £150.
Cambridge, Addenbrooke's Hospital.—H.S. and H.P. Each at rate of £130.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Senior and Junior H.S. At rate of £100 and £50 respectively.
Charing Cross Hospital, W.C.—Asst. Obstet. P.
Charing Cross Hospital, Institute of Pathology.—Pathologist. £500.
Clinical Research Association, Ltd., Watergate House, Adelphi, W.C.—Part-time Asst. Director of the Labs. £250.
Elizabeth Garrett Anderson Hospital, Euston-road.—Phys. in charge of Children's Dept.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Glasgow, Gartland Mental Hospital, Gartcosh.—Jun. Asst. M.O. At rate of £300.
Hereford County and City Mental Hospital.—Second Asst. M.O. £350.
Hertford County Hospital.—H.P. At rate of £150.
Hospital for Consumption and Diseases of Chest, Brompton, S.W.—Asst. Surg. to Throat, Nose, and Ear Dept.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W.—Res. H.S. At rate of £75.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. and Asst. Cas. O. Each at rate of £56.
Huddersfield, Storthes Hall Mental Hospital, Kirkburton.—Med. Supt. £1000.
Ilford Borough Maternity Home.—Obstet. Consulting Surg.
Jerusalem Ophthalmic Hospital.—Sub. Warden. Also Registrar.
King's Lynn, West Norfolk Hospital.—Jun. H.S. £100.
Leeds University.—Cancer Research Fellowship. £500.
Liverpool, Royal Southern Hospital.—Hon. S., Hon. Dermatologist, and Hon. Ophth. S.
Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.
Manchester, Monsall Hospital for Infectious Diseases.—Two Jun. Med. Assts. Each £350.
Manchester Royal Infirmary.—J.H.M.O. in Radiological Dept. At rate of £250.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Miller General Hospital for South East London, Greenwich-road.—H.P. £125.
National Dental Hospital, Great Portland-street, W.—Hon. Radiologist.
Northampton County Borough.—Asst. M.O.H. £600.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.
Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Second Res. O. £175.
Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s. and H.P. At rate of £120. Also Jun. H.S. and Jun. H.P. At rate of £90.
Royal Halifax Infirmary, Halifax.—Third H.S. (Male). £100 per annum.
Ryde, Royal Isle of Wight County Hospital.—Vacancy on Hon. Med. Staff.
St. Bartholomew's Medical College, E.C.—Sen. Demonstratorship of Pathology.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Hon. Surg. to Out-patients.
Seamen's Hospital Society, Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.
Seamen's Hospital Society, Albert Dock Hospital, Connaught-road, E.—H.S. At rate of £110.
Sheffield Royal Hospital.—Sen. Cas. O. £150.
Sheffield Royal Infirmary.—Asst. S. to Ophthalmic Dept.
Southampton County Borough Isolation Hospital.—Res. M.O. £360.
South London Hospital for Women, South Side Clapham Common, S.W.—H.P. and H.S. Each at rate of £50.
Sudan Government Medical Dept.—M.O. £E.720.
University of London, South Kensington, S.W.—Chair of Anatomy. £1000.
Walthamstow, Wanstead and Leyton Children's and General Hospital, Orford-road, Walthamstow, E.—Hon. Ophth. S.
West-End Hospital for Nervous Diseases, Regent's Park, N.W.—Anæsthetist.
Worcestershire County Council.—Asst. Co. M.O. £600.
York City.—Asst. M.O.H. &c. £600.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Rocester (Staffs), Selkirk (Selkirkshire), and Bakewell (Derbyshire).

The Secretary of State for the Home Department gives notice that, in consequence of the resignation as from March 31st, of Dr. E. J. Lloyd, Medical Referee under the Workmen's Compensation Act, 1925, for the Districts of the Bangor, Conway, Llandudno and Colwyn Bay, and Llanrwst County Courts (Circuit No. 29), the appointment held by him will become vacant. Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than April 6th, 1927.

Births, Marriages, and Deaths.

BIRTHS.

CRONK.—On March 13th, at Osborne House, Queen's-road, Ashton-on-Mersey, Manchester, the wife of H. L. Cronk, M.A., M.D. Camb., of a son.

MARRIAGES.

COLLIS—FODEN.—On March 5th, at the Church of St. Mary-le-Bow, Cheapside, G. E. Cecil Collis, M.B., B.S. Lond., M.R.C.S., L.R.C.P., to Mary Stuart A. Foden, M.B., B.S. Lond., elder daughter of Mr. and Mrs. E. A. Foden, of Teddesley, Penkridge, Stafford.

DEATHS.

CORKEY.—On March 7th, very suddenly, Isaac Whitla Corkey, M.C., F.R.C.S., of Ladbroke-road, Epsom.
CUTHBERT.—On March 11th, at the Royal United Hospital, Bath, Harry Edward Cuthbert, B.M., B.Ch., aged 26 years.
GARRETT.—On March 7th, at Cheltenham, Percy Charles Garrett, M.R.C.S., L.R.C.P., in his 47th year.
GORST.—On March 5th, at Llanbedr Hall, Ruthin, Raymond Barclay Gorst, M.B., Ch.B., D.M.R.E., late of Littleborough, Lancs.
HAYNES.—On March 12th, at Evesham Hospital, after an operation, Horace Eyre Haynes, M.R.C.S., L.S.A., J.P., of Greyfriars, Evesham, and Littleton Hall, Brentwood, aged 80 years. R.I.P.
MUSPRATT.—On March 10th, at Madeira-road, Bournemouth, of heart failure, Charles Drummond Muspratt, M.D., F.R.C.S., aged 68 years.
SOUTHAM.—On March 9th, at Kinnaird-road, Withington, Manchester, Frederick Armitage Southam, F.R.C.S., Consulting Surgeon, Manchester Royal Infirmary, Emeritus Professor of Surgery, Manchester University.
SWAIN.—On March 7th, Dr. John Moore Swain of Long Clawson, Melton Mowbray, aged 100.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NURSING OF THE INSANE.—The Minister of Health, accompanied by Sir Kingsley Wood, received on Feb. 16th a deputation from the Trade Union Congress General Council introduced by Mr. George Hicks, who submitted, amongst others, a resolution, passed by the Bournemouth Trade Union Congress last September, stating that the Congress deplored the practice of employing female nurses for attendance on male insane patients, believing it to be detrimental to the best interests of the patients, harmful to their prospects of recovery, and dangerous to the interests of the nurses so employed. The Minister replied that he had taken the best advice available and did not agree that it was in all cases preferable for male patients to be nursed by male nurses.

Notes, Comments, and Abstracts.

RHEUMATIC INFECTION OF CHILDHOOD.*

BY CAREY F. COOMBS, M.D., F.R.C.P. LOND.,
PHYSICIAN WITH CHARGE OF OUT-PATIENTS, BRISTOL GENERAL HOSPITAL.

I.—*Concluded from p. 580.*

The Mechanism of Infection.

I COME next to a consideration of the bacteriology of the disease. As Dr. Poynton and I have recently published a full review [1] of this matter, you will allow me, perhaps, to state baldly and without argument a belief in the streptococcic hypothesis of the disease. To my mind the view, which we owe to the long and patient researches of Poynton and Paine, that the exciting cause of these lesions is a streptococcus probably derived from and certainly very similar to those normally present in the human alimentary tract, is valid and has no rival. Even those who cannot bring themselves to accept this hypothesis put forward no alternative.

The most important deduction from the streptococcal theory, so far as prevention is concerned, is the futility of expecting to destroy this disease by any attempt to eradicate its infective agent. This is probably a constant inhabitant of the healthy human body, or at all events a near relation of such inhabitants, and any effort to free ourselves from its existence would be about as profitable as a campaign for the extermination of the common dandelion. It is not to measures of this kind, but rather to a general overhaul of the conditions under which the virus enters and injures the body, that preventive medicine must devote its energies. We have, in fact, to face in this disease one in which the bacterium itself is of relatively little importance, and can only do harm when a certain group of conditions coincides to make the resistance of the individual inadequate.

Let us look first at those properties of the body itself which influence its capacity to resist the rheumatic infection. First, we have to scrutinise what are called the portals of entry. The body is protected from the outer world not only by its skin, but also by the epithelial membranes that line the alimentary, respiratory and genito-urinary tracts. These infoldings of the body's surface carry to its inmost citadel lines of lessened resistance like subterranean passages honeycombing the foundations of a fortress; and, like such secret passages, coming at points into the closest contact with the open thoroughfares of the invaded city.

One of these points of contact is to be found in the tonsil a mass of lymphoid cells, one of whose chief functions appear to be to entomb and destroy bacteria. On the deep side these cells are in free and direct contact with the circulating fluids of the body. On their surface they are brought into an equally direct relation, through the crypts which pierce their substance, with the bacteria that live in the mouth. They serve as a go-between for these bacteria and the blood of the living organism of which they are a part. Perhaps it is one of their functions to make these two, the bacteria and the blood fluids, acquainted with each other, and to teach them a kind of mutual forbearance. But, unfortunately, this ideal is not always attained. Often the bacteria take advantage of the tonsil, so to speak, and push their way in so boldly that in spite of a stout resistance on the part of the tonsillar tissues, they enter freely into the blood fluids by which these tissues are bathed. Then ensues the train of events recognised as manifestations of the rheumatic infection.

Estimates of the frequency with which that infection is ushered in by a recognisable tonsillitis vary widely. Probably the proportion of one-third, to which both Poynton and Miller approximate very closely, represents the general experience. At all events, we may assume that in not more than half the cases the onset of rheumatic infection is declared by an act of open hostilities in the region of the tonsils. And what happens in the other half? Do the organisms sneak through the tonsils without exciting any local resistance? Or do they enter elsewhere? The small intestine contains very many lymphoid masses similar to the tonsils, yet—apart from an occasional and rather doubtful relation between appendicitis and rheumatism—it is difficult to trace any evidence of strife between body and bacteria at these intestinal outposts. C. W. Vining has suggested that a relation exists between faulty dieting in childhood and the rheumatic infection, and Miller has initiated an inquiry into the bacterial content of the alimentary excreta of the rheumatic child. It is generally agreed, I believe, that dental disease does not predispose the growing child to rheumatic infection. At present, however, it cannot be said that we know anything for certain about any portal of entry other than that furnished by the tonsil. We are not sure whether the infection always goes in by the tonsil or whether it sometimes uses an alternative route.

[1] Supplement to Brit. Med. Jour., July 3rd, 1926.

Tonsillectomy.

This uncertainty is reflected in the division of opinion that is found in the medical journals about the advisability of removing the tonsils of the rheumatic child. Those who favour this plan do so because they think that to remove the tonsil is to remove the organisms that are on their way into the body to continue the evil work already begun by their predecessors. Against this it is argued that removal of the tonsil does not remove from the mouth the bacteria that are potential causes of rheumatic infection; while, on the other hand, it may mean removal of tissue which has an actual defensive value and thus a lowering of the resistance to the infection. Also, it is possible that there are other avenues than the tonsil by which these organisms enter. Unfortunately, the appeal to clinical results is answered by conflicting voices. Some say that tonsillectomy is followed by freedom from evidences of active infection; others, that on the whole there is no difference between the course of the disease in children whose tonsils have been removed, and its behaviour in those whose tonsils have been left. Miller's series, though limited, yielded a suggestive result, in that he found that rheumatic infection in the child whose tonsils had been removed was more often liable to manifest itself in an uncomplicated chorea than in the children whose tonsils had not been removed.

Now, chorea is the most easily excited of all the rheumatic phenomena. It takes a smaller dose of infection to upset the brain than it does to inflame the heart or joints, or to call into being a subcutaneous node. Chorea is more often met with as a solitary manifestation of rheumatic infection than any of the others. Possibly, therefore, extended experience may prove that removal of the tonsils does actually tend to reduce the severity of the infective process. At the present time the sound rule appears to be to judge each case on its merits, and to have the tonsils removed if it appears from the history, or the condition of the throat on examination, or both, that these have served or are likely to serve as a breach in the defences through which the enemy may enter.

Methods of Defence.

Next let us consider what defensive mechanisms are at the disposal of the infected body, and by what means they may be reinforced. I do not propose to enter upon a discussion of the machinery of immunity, except to remind you that most infections excite against themselves not merely the general reactions by which living tissues oppose inimical particles, but also certain specific reactions which issue in the formation by the body of biochemical antidotes exactly suited to neutralise the particular poison of the moment. It is this principle that is the basis of all treatment by vaccines and sera, and it is natural that we should look to such methods for help in the fight against rheumatic infection. Up till now, moreover, we have had little encouragement from this quarter and, on the whole, it is not likely that we shall get much. So far as there has been investigation of the immune bodies formed in reply to streptococcal infection of the heart, it has shown a remarkable variability from one individual to another. This does not seem to warrant any great hope that it may be possible to add to the bodily economy from without, some standard protein antidote by which its recipient may be better defended against the streptococci of rheumatic infection. It is rather from a consideration of those conditions without the body which predispose it to this infection that we shall derive the basis for a policy of prevention.

Damp.

First among these conditions I am going to put dampness. There is a time-honoured tradition that wet feet cause rheumatic fever. In its favour many isolated experiences can be quoted, but it is as impossible to prove from these a causal connexion between the two as it would be to prove that tuberculous meningitis is provoked by blows on the head, or that Mephibosheth was paralysed in both his feet because his nurse dropped him. And it is difficult to counter in any effective way the fact that the Army in Flanders, during the recent war, was remarkably free from the usual evidences of rheumatic infection.

Among the small group of cases analysed by Askins and Morrison, there was an appreciable number in which the parents ascribed the onset of the disease to some accidental exposure of the child to wet. But more numerous and, in the light of the experience of others, more significant, were the cases in which the rheumatic infection attacked a child living in a house proved by careful inspection to be damp or, at all events, built on soil within a short distance of one of Bristol's waterways. Until I saw these reports

I was inclined to doubt the connexion between dampness and rheumatic infection. However, these altered my views; and although I should like to see how close the relationship is found by a wide and long inquiry to be, it seems to me unwise to postpone any action in the matter for the sake of securing ampler evidence. The Cardiac Subcommittee of the British Medical Association is taking counsel of the Royal Institute of British Architects, and this ought to lead to some effective action. Sir George Oatley, F.R.I.B.A., has discussed this matter with me, and has given me the benefit of his long experience, which goes to show that both in preparation of the site and in building of the house itself there are possibilities of error which vary inversely as the conscientiousness of the builder. There never was a time when it was more necessary to lay stress on housing conditions. We are building, not merely new houses, but new suburbs on a scale beyond anything within living memory. Let us hope that there will be a marked fall in the incidence of rheumatic heart disease among the children born and brought up in these houses; but in the meantime, I think it is our duty to insist on the desirability of dryness in the choice of sites and the development of building schemes.

Other Ætiological Factors.

There are three or four other ætiological factors to which I must refer, though their share in any preventive plan is by no means obvious; partly because we are not yet sure how far they really do help to cause this disease, partly because it is not easy to see how their incidence can be reduced. Yet I believe a knowledge of their existence and influence may modify helpfully, if indirectly, any plans that may be devised for the prevention of the rheumatic infection.

The first of these may be dismissed in a word or two, as it is becoming generally understood that the carditis that occasionally complicates scarlet fever is really rheumatic. It seems that scarlet fever, perhaps in its attack on the tonsils, makes a breach in the bodily defences through which the rheumatic infection can enter. Any or all of the cardinal manifestations of that infection may follow, and among these we must place first in importance cardiac inflammation. In its clinical course as well as in its microscopical characteristics this is identical with rheumatic carditis, and it calls for the same prolonged and minute care.

Poverty and Life in Towns.

Another much more debatable factor is the social one. Its existence is proved beyond doubt, but what we do not yet know is exactly what social stratum it is that suffers. We do know this, that cardiac rheumatism is a relatively rare disease among the wealthier classes. I may also add, in parenthesis, that when it does attack a well-to-do child it is, on the whole, less to be feared than in a child less fortunately surrounded. Whether this is wholly due to the more prolonged and skilled care given to such a child, or to better food, or to a more generous reserve of energy, it is not easy to be sure. But the results that can be achieved in such children are encouraging enough to justify a hope that when hospital accommodation allows us to provide conditions of treatment for the poorer children as adequate as the wealthier ones already enjoy, we shall see a sensible reduction in the crippling effects of this infection.

But if poverty, using that term in its widest sense, is a factor in the causation of this disease, what element of poverty is it that we must blame and correct? Is it the whole complex of influences that constitute the meaning of poverty, or is it some one particular component of that complex? We may ask the same question about another influence, that of urbanisation. Here, however, we are on even less secure ground, for we are not yet sure that the city child is more liable to rheumatic infection than the rural one. This is one of the points that I hope we may be able to test by the research of which I have already spoken. In the area under consideration we have one city of 400,000, and three or four other towns or cities of 50,000 or more, set in the midst of a community that is otherwise rural. If there is anything in the surmise that urbanisation tends to increase rheumatic infection, it ought to come out in this inquiry.

But supposing we do prove conclusively that this infection falls more heavily on the industrial suburbs of our great towns, what good is it going to do? I think much benefit may be derived if this knowledge is backed by increasing evidence of the importance of dampness in houses. Already there is enough in support of this triad—dampness, poverty, and urbanisation—to justify us in believing that as the public becomes aware of its existence and converts its knowledge into action, we shall see a reduction in the incidence of rheumatic infection.

Diagnosis, Treatment, and Prevention.

This brings me to a mention of the last of the ætiological influences of which I shall speak—namely, heredity. It is a curious paradox that while there is more and more talk of heredity as an influence in the causation of disease, we are doing all that we can to destroy the one weapon by which we can hope to have much direct influence on the familial factor in disease. In the past 20 years we have been busy providing doctors for the school child, doctors for the tuberculous and the syphilitics, doctors for the factories and the insurance societies; but no one thinks of seeing to it that every family in the land shall have a doctor. Is it because there are ceasing to be any families? If so, there is little that we can do, and, for that matter, little need to do it; but if family life is to continue and to re-establish itself in this complex experiment that we call civilisation, one thing that must be looked to is the provision of medical services for the family as a unit. Only in this way can we hope either for reliable information, or for effective action, in dealing with the familial factor in disease.

Last of all, let me plead for the retention of the hospital physician in any plan of campaign that we may devise. We ought already to have learnt from the struggle against tuberculosis that a wide clinical experience is needed if we are to discriminate between that which is tuberculosis and that which is not. I am sure this is going to prove equally true of the rheumatic infection. My own experience is that more mistakes are made in the direction of diagnosing rheumatic infection when it is not there than in the direction of overlooking that which is there. It is very difficult to recognise the imitations and nothing except long experience will ensure its being done. That experience those of us who are doing out-patient work in the general and children's hospitals have acquired; any plan that fails to mobilise that experience will be throwing away one of our greatest assets. Moreover, it is in these hospitals that our students are most conveniently trained. The unbalanced enthusiasms that have sowed clinics of all kinds here, there, and everywhere in our great cities, are making it increasingly difficult to give medical students an all-round education. If this insane tendency also gets hold of the campaign against rheumatic heart disease and diffuses its energies into special cardiac or rheumatic clinics, divorced from the places in which students are taught, we shall quite certainly fail to suppress the disease in this generation or provide for the struggle against it in the next. We are in for a long war and we must make our plans accordingly.

Let me here summarise what has been said on the steps to be adopted for the prevention of the rheumatic infection in childhood. In the first place, every care must be taken to ensure, as far as may be, prevention of damp in houses. Not only must each house be protected by the best means available against damp from below, but also no site suspected of dampness should be used. Secondly, further research must be made into the part played by social and economic factors in the causation of the disease. Third, the influence of tonsillitis and scarlet fever in predisposing to rheumatic infection must be remembered and dealt with on its own merits in each case. Fourth, more knowledge of the bacteriological aspects of the problem is much to be desired. Finally, it is devoutly to be hoped that all branches of the medical profession may be brought together in providing for early diagnosis and adequate treatment of the disease.

A RECTIFIER FOR ULTRA-VIOLET THERAPY.

THE Medical Supply Association have produced a rectifier for use in ultra-violet therapy, which makes it possible to run a mercury lamp or metallic tungsten arc from an alternating voltage supply. The instrument consists essentially of an auto-transformer, in the secondary circuit of which an electrolytic rectifier of the usual type and an iron-cored choke are connected in series with the arc and its starting-up resistance. The innovation (for which a patent has been applied for) is in the choke coil which is designed to maintain steady conditions. The transformer is fitted with tappings which are used first to permit of a step-up or step-down effect, according to the voltage of the mains, and secondly to allow of the arc being struck at a low voltage and then, as soon as running conditions are obtained, the higher operating voltage is applied to the lamp circuit by a change-over switch which makes contact to another tapping. The current, which can be drawn from the instrument, depends on the size of the chemical rectifier, and, in the case of the first models made, the maximum value is about 5 amperes, a current quite adequate for the two types of lamp mentioned above. The apparatus should prove of considerable value in cases where alternating current only is available, as it permits of the use of ordinary direct current burners, whilst the inclusion of an auto-transformer in the design ensures that a high percentage of the power drawn from the mains is expended in the lamp itself. Both mercury and tungsten arcs are found to run quite steadily and normally when operated by the rectifier.

NEW PREPARATIONS.

EPHEDRINE.—We have received from British Drug Houses Ltd., 16-30, Graham-street, City-road, E.C., samples of the tablets for oral administration and the ampoules for hypodermic use of ephedrine hydrochloride, a drug which has been found really valuable in the treatment of asthma, and prophylactically for low blood pressure in pneumonia. The firm have been making this alkaloid in their laboratories for some months past and now are manufacturing it upon a commercial scale from the Chinese plant Ma Huang (Ephedra vulgaris) imported by them.

METAPHEN (Abbott) is a powerful mercurial germicide for which it is claimed that it has 500 times the strength of phenol; the chemical name is di-acetoxymercuri-4-nitro-2-cresol. It is a new organic mercury compound, and experience has shown that supplied in the form of a 1 : 500 (or 0·2 per cent. aqueous solution) it may be kept for a long time in tightly stoppered bottles without any loss of germicidal potency and unaffected by the light or temperature of an ordinary room. It is odourless, almost tasteless, does not stain either the skin or garments, and, further, when used as a disinfectant, does not tarnish instruments even when they are immersed in a 1 : 1000 solution of the compound for a week. As a skin disinfectant in dilutions of 1 : 5000 sterilisation can be obtained. The sample bottle submitted to us was an alkalinised 1 : 500 solution so that the usual 1 : 5000 is easily made by the addition of 1 part of the preparation to 9 parts of water. The bacteria employed in testing the preparation were the *Staphylococcus aureus*, gonococus, and *Bacillus typhosus*, and directions for use of weak solutions for urethral injections are sent with the preparation. Other main indications for therapeutic employment are skin affections, pyogenic or parasitic, rhinitis and coryza. Metaphen is supplied by E. H. Spicer and Co., Ltd., 72, Wigmore-street, W. 1.

TRIXYL, as prepared by Trixyl Antiseptics Ltd., Otterbourne, near Winchester, is an antiseptic preparation designed for external and internal use and for inhalation. It is stated to be a compound derived from such vegetable essences and essential oils as eucalyptol, guaiacol, menthol, thymol, and terpinol, and the inventors lay stress on its use as an inhalation in irritative conditions of the air passages. An ingenious little inhaler is supplied for use with the drug, so made that the bulbous end can be used for nasal inhalations and the narrow end for buccal use.

BRAILLE "WIRELESS" PROGRAMMES FOR THE BLIND: AN APPEAL.

Captain Sir Beachcroft Towse, V.C., K.C.V.O., C.B.E., has recently broadcasted an appeal for funds for the production, by the National Institute for the Blind (Headquarters: 224, Great Portland-street, London, W.1), of an adequate wireless programme in Braille embossed type—an excellent and much-needed innovation.

This is an essential service for the blind, among whom are many wireless enthusiasts, these becoming participators in the life of the world. At present, however, the blind are absolutely dependent on sighted friends for their knowledge of the daily programmes. Much interest has been shown in the scheme by the British Broadcasting Corporation, and the *Radio Times* has already made arrangements for supplying the Institute with the necessary details of forthcoming programmes in advance of publication, and, of course, without copyright fee.

As soon as £700 is raised, a weekly programme will be produced to be sold to the blind at the nominal figure of 6*s.* 6*d.* per annum, post free. The capital sum is needed for the purchase of a new embossing machine, as the present plant at the Institute—the largest publishers for the blind in the world—is constantly at work producing Braille periodicals and books in their thousands. The blind will produce their programmes themselves, the procedure being as follows: As soon as the "copy" for the programme is ready, it will be handed to a sighted reader who will dictate it to a blind stereotyper, who will transliterate each word into Braille, when it is embossed on a metal plate. When a plate is completed, a proof copy will be read for press correction by a blind proof-reader, when the plate will be inserted in the embossing machine, as many copies as are required being supplied on specially prepared paper. The sheets are then gathered together, collated by the blind, and bound into programmes ready for delivery to all parts of the world.

An appeal is now issued by Mr. J. De La Mare Rowley, General Editor, National Institute for the Blind, and is directed to listeners throughout the country with the hope that they will assist as generously as possible. All donations should be addressed to the Secretary-General (Braille Wireless Programmes Fund), National Institute for the Blind, 224–8, Great Portland-street, London, W.1.

THE FOOD VALUE OF COCOA PROTEINS.

THE value of cocoa and chocolate as sources of protein in the diet would appear from the work of H. H. Mitchell, J. R. Beadles, and M. H. Keith (*Jour. Biol. Chem.*, 1926, 71,15-31) to be small. According to these workers, cocoa, with an average crude protein content of 21·5 per cent., yields 8·2 per cent. of digestive crude protein and only 3 per cent. of net protein available for replenishing and adding to the body proteins. Chocolate, which contains less protein than cocoa, must be even less valuable in this respect. Those who use cocoa and chocolate as adjuncts to a diet which is normally sufficient or who find chocolate a useful stop-gap when stranded in districts where reasonable meals seem to be unobtainable—and there are still some such districts—will not be much disturbed at these findings. They are, however, of importance to those for whom cocoa, made with watered milk, bread, and margarine form the staple diet.

PERSISTENT BOILS.

To the Editor of THE LANCET.

SIR,—Replying to W. L. C.'s inquiry (March 12th, p. 582) on the treatment of persistent boils, the best result will, in my opinion, be obtained by the use of "Stannoxyl," 3 to 4 tablets daily, combined with the hypodermic injection of 10 c.cm. sterilised milk once a week. From two to three injections are required.

I am, Sir, yours faithfully,
JAMES HASSON, M.D.

Cleveland-square, W., March 11th, 1927.

To the Editor of THE LANCET.

SIR,—I would suggest to W. L. C. that he tries the following method which I have found successful in a good many similar cases. Apply with a camel's hair brush to the whole area of skin affected and a wide area round it either tinc. iodi. or a 1-2000 or 1-3000 solution in rectified spirit biniodide of mercury every three or four days. If the area is a large one it may be wise to treat it with biniodide in sections, having in view the possibility of absorption. The method is reasonable in view of the fact that boils result from infection of hair follicles by staphylococci.

I am, Sir, yours faithfully,
BRUCE C. KELLY, M.B., C.M. Edin., M.R.C.S. Eng.

Buckland Newton, Dorchester, March 13th, 1927.

THE SUPPLY OF BLOOD DONORS.

To the Editor of THE LANCET.

SIR,—May I appeal through your columns for volunteers to join the Blood Transfusion Service which is organised by the British Red Cross Society with the assistance of the British Hospitals Association and the Rover Scouts, and is now under the management of a Committee representative of these three bodies? During the past five years nearly 1400 volunteers, of whom a large majority were Rovers, have given their blood to hospitals, nursing homes, and urgent private cases. The total number of volunteers on the list is about 350, but during 1926, 737 calls for help were made and answered, and these are increasing so rapidly —122 already this year—we shall soon be unable to meet the demands.

The operation is nearly painless and quite harmless. The donor is quite able to return to work after half an hour's rest without fear of after-effects. The Service is entirely voluntary, but fares, time lost from work, and all other expenses are refunded by the Committee. Most men between the ages of 18 and 50 and many women are competent to render the service, only eight volunteers having so far been rejected. The privilege or saving a human life is given to but few, but here is not only an opportunity but a practical certainty at the cost of a few hours' time and slight persona inconvenience.

May we also make a very strong appeal to employers to permit volunteers in their service to act in emergency cases during business hours? The time lost is not great; the expense is made good, and the donor is not in the least incapacitated. We ask this because there are less than 50 members at present available during the daytime, and most of these have already been used once this year, and we are told that it is not easy to get leave from employers.

The Society will be pleased to send a speaker to explain the nature of the Service to organisations interested. Individual inquirers may obtain particulars at any time from the Honorary Secretary, 210, Peckham Rye, S.E. 22 (Telephone (night and day) New Cross 1606).

We are, Sir, yours faithfully,
ARTHUR STANLEY,
British Red Cross Society.
KNUTSFORD,
British Hospitals Association.
C. LISLE WATSON,
Rover Scouts.

19, Berkeley-street, W. 1,
March 10th, 1927.